

# CALORIMETRY EXCHANGE REPORT

ANNUAL REPORT



JANUARY–DECEMBER 2005

B. Srinivasan, Willard C. Losinger, Nancy Hui,  
Joseph Waggoner, and Jon Neuhoff





U. S. DEPARTMENT OF ENERGY

# CALORIMETRY EXCHANGE PROGRAM

ANNUAL REPORT  
JANUARY - DECEMBER 2005

B. Srinivasan, Willard C. Losinger, Nancy Hui, Joseph Waggoner  
and Jon Neuhoff

NEW BRUNSWICK LABORATORY

9800 South Cass Avenue  
Argonne, Illinois 60439

July, 2006

NBL Home Page: [www.nbl.doe.gov](http://www.nbl.doe.gov)  
NBL Internet Address: [USDOE.NBL@CH.DOE.GOV](mailto:USDOE.NBL@CH.DOE.GOV)  
NBL Telephone Number: 630-252-2442  
NBL Facsimile Number: 630-252-6256



**TABLE OF CONTENTS**

|  |     |
|--|-----|
| NBL: HISTORY AND MISSION.....                                  | v   |
| ACKNOWLEDGEMENTS.....  | vii |
| ABSTRACT .....   | ix  |
| A. INTRODUCTION.....   | 1   |
| B. CALORIMETRIC STANDARDS.....                                 | 2   |
| C. PARTICIPATING DOE FACILITIES.....                           | 4   |
| D. EVALUATION OF CY 2005 RESULTS AND REPORTING FORMAT .....    | 4   |
| E. CONCLUSIONS .....   | 7   |
| F. PLANS FOR JULY 2006 TO JUNE 2007 .....                      | 8   |
| G. Pu MASS TABLES AND GRAPHS.....                              | 9   |
| H. POWER MEASUREMENTS TABLES AND GRAPHS.....                   | 17  |
| I. $P_{\text{eff}}$ VALUES TABLES AND GRAPHS.....              | 31  |
| J. $^{238}\text{Pu}$ ISOTOPE ABUNDANCE TABLES AND GRAPHS.....  | 47  |
| K. $^{239}\text{Pu}$ ISOTOPE ABUNDANCE TABLES AND GRAPHS ..... | 63  |
| L. $^{240}\text{Pu}$ ISOTOPE ABUNDANCE TABLES AND GRAPHS ..... | 79  |
| M. $^{241}\text{Pu}$ ISOTOPE ABUNDANCE TABLES AND GRAPHS ..... | 95  |
| N. $^{241}\text{Am}$ ISOTOPE ABUNDANCE TABLES AND GRAPHS.....  | 111 |



## **NBL: HISTORY AND MISSION**

The New Brunswick Laboratory is owned and operated by the United States Department of Energy through the offices of Security and Safety Performance Assurance (SP-1) and Technology and Field Assistance (SP-30). The laboratory was established in 1949 as an analytical chemistry laboratory in New Brunswick, New Jersey to provide support to the United States Atomic Energy Commission. At that time, it was staffed by scientists from the National Bureau of Standards who had contributed significantly to nuclear material measurement programs in the Manhattan Project. At the New Brunswick Laboratory, they provided the technical expertise and skills to solve problems related to quantitative analyses of uranium-bearing materials. Over the years, these scientists and others following them have expanded the capabilities of the laboratory to include chemical and mass spectrometric analyses of plutonium and other trans-uranium elements, research and development activities in chemical analyses techniques, preparation of certified reference materials, and operation of the nuclear safeguards measurement evaluation program. In 1977, the laboratory moved from New Jersey to its present location at the Argonne National Laboratory site in Illinois.

The major mission of the New Brunswick Laboratory is to provide technical assistance to the Department of Energy in the following areas: measurement evaluation program operation, certified (nuclear) reference materials preparation, measurement techniques development, and measurement services to domestic and international customers. In addition to fulfilling these tasks, the laboratory helps the Department in three other areas: conducting technical audits, resolving shipper/receiver differences in material transfers, and assisting in nuclear nonproliferation programs.





## **ACKNOWLEDGEMENTS**

The Safeguards Measurement Evaluation Program is administered by the United States Department of Energy, Office of Technology and Field Assistance (SP-30) in the Office of Security and Safety Performance Assurance (SP-1). The authors of this report thank Michael Soriano of NBL for help in correcting coding errors in the database software.



## ABSTRACT

The New Brunswick Laboratory has been tasked by the United States Department of Energy (DOE) Office of Technology and Field Assistance (SP-30) in the Office of Security and Safety Performance Assurance (SP-1) to evaluate the quality of measurement techniques in nuclear materials accounting practices at Department of Energy facilities. Both destructive and non-destructive methods of analyses come under this purview. The destructive methods are evaluated in the Safeguards Measurement Evaluation program, and the non-destructive methods in the Calorimetry Exchange (CALEX) Program. This report describes the activities in the calendar year (CY) 2005 (January-December 2005) CALEX Program. The Safeguards Measurement Evaluation Program activities are described in a separate report.

Two DOE facilities participated in the CY 2005 CALEX Program. The facilities analyzed a plutonium oxide reference material standard by non-destructive techniques of calorimetry and high resolution gamma spectrometry. Calorimetry was used to measure the power output, and gamma spectrometry was used to measure the plutonium and americium isotopic abundance. NBL evaluated the measurement results. Pu mass, effective specific power ( $P_{eff}$ ), and isotopic abundance were compared against corresponding reference values. Differences between measured and reference values were expressed in terms of  $M/A$ ,  $M-A$ , and  $(M-A)/A$ , where  $M$  stands for measured and  $A$  for accepted (reference) values corrected for radioactive decay. The CY2005 Calorimetry Exchange Report is not only a repository for the measurement results, but also provides performance evaluation summaries on quarterly and annual bases.



## A. INTRODUCTION

The New Brunswick Laboratory (NBL) is a nuclear material measurement laboratory of the U.S. Department of Energy (DOE). NBL reports to the DOE Office Technology and Field Assistance (SP-30) in the Office of Security and Safety Performance Assurance (SP-1).

An important aspect of NBL's mission is to assist DOE in conducting the Measurement Evaluation Program. In this program, NBL evaluates the quality of nuclear material measurements performed by DOE facilities for Materials Control and Accountability (MC&A) purposes. The facilities are required to participate in the program because it provides an independent verification of internal analytical quality control practices. The NBL Measurement Evaluation Program consists of two parts: the Safeguards Measurement Evaluation (SME) Program for evaluating destructive analysis results (e.g., titration, mass spectrometry), and the Calorimetry Exchange (CALEX) Program for evaluating non-destructive analysis results (i.e., calorimetry and high resolution gamma spectrometry). This report deals with the results from the CALEX Program. The SME Program results appear in a separate report.

The specific goals and objectives of the CALEX Program are as follows:

1. Evaluate calorimetry and high resolution gamma spectrometry measurement results reported by DOE laboratories on plutonium oxide reference material standards.
2. Maintain a permanent data base of calorimetric and gamma spectrometry measurements (mass of plutonium, calorimetric power, effective specific power ( $P_{\text{eff}}$ ) and isotopic abundance).
3. Provide performance evaluation reports to program participants and to DOE.
4. Evaluate additional reference material standards needed in the CALEX Program.
5. Expand the scope of the CALEX Program to include evaluation of results from other methods of non-destructive analysis (e.g. neutron measurements).

## B. CALORIMETRIC STANDARDS

Two different reference material standards, Calex 1 and Calex 2, are available for use in the Measurement Evaluation Program. Calex 1 was made in 1979 by Mound Applied Technologies, and Calex 2 was created in 1995 by the Los Alamos National Laboratory (LANL). Six identical units of Calex 1 and ten identical units of Calex 2 were made and distributed to DOE facilities. Both standards contain plutonium in the form of plutonium oxide.

In this report, Calex 1 measurement results were evaluated against reference values given in Table 1, with appropriate corrections for radioactive decay.

**Table 1. Characterized values for calorimetric standard Calex 1.**

| Parameter                        | Calex 1<br>as of 05/29/1979 |
|----------------------------------|-----------------------------|
| PuO <sub>2</sub> mass            | 454.60 g                    |
| Pu concentration                 | 87.8191 wt %                |
| Pu mass*                         | 399.23 g                    |
| <sup>238</sup> Pu**              | 0.0102 wt %                 |
| <sup>239</sup> Pu**              | 93.7336 wt %                |
| <sup>240</sup> Pu**              | 5.8560 wt %                 |
| <sup>241</sup> Pu**              | 0.3712 wt %                 |
| <sup>242</sup> Pu**              | 0.0290 wt %                 |
| <sup>241</sup> Am#               | 0.0061 wt %                 |
| P <sub>eff</sub> <sup>†</sup>    | 2.3012 mW/g                 |
| Calorimetric power <sup>††</sup> | 918.71 mW                   |

\*The Pu mass in the standards is calculated as the product of PuO<sub>2</sub> mass and Pu concentration.

\*\*Pu isotopic abundance, g Pu isotope / g Pu (in %).

# <sup>241</sup>Am concentration, g <sup>241</sup>Am / g Pu (in %)

†P<sub>eff</sub> values are calculated as a sum of products of isotopic abundance and respective specific power, the latter given in Table 2.

††The calorimetric power is calculated as a product of Pu mass and P<sub>eff</sub>.

The radioactive decay half-life values used in the calculations are shown in Table 2. The table also shows specific power for plutonium and americium isotopes, values needed to calculate  $P_{\text{eff}}$  values.

**Table 2. Radioactive decay half-lives for plutonium isotopes and  $^{241}\text{Am}$ , and effective specific power of each isotope.**

| Isotope           | Half-life (year)<br>used for<br>CY 2005 Calex<br>Program | Specific<br>power<br>(mW/g) |
|-------------------|--|-----------------------------|
| $^{238}\text{Pu}$ | 87.74  | 567.57                      |
| $^{239}\text{Pu}$ | 24119  | 1.9300                      |
| $^{240}\text{Pu}$ | 6564   | 7.0800                      |
| $^{241}\text{Pu}$ | 14.35  | 3.410                       |
| $^{242}\text{Pu}$ | 373000   | 0.1200                      |
| $^{241}\text{Am}$ | 433.00   | 114.2                       |

Calex 2 plutonium oxide material measurement results are not evaluated in this report, pending the certification of plutonium assay, plutonium isotopic abundance, and  $^{241}\text{Am}$  abundance values. These values were measured in characterization experiments performed by LANL in 1995, and by NBL in 1999. Because of a difference of about 0.3% in the plutonium assay measurement between the two laboratories, NBL did not issue a formal Working Reference Material Certificate for Calex 2. This difference was considered as excessive, because the controlled potential coulometry method used at the two laboratories for plutonium assay is capable of yielding results within 0.05%. NBL made a number of attempts, using fresh samples of the Calex 2 material from the Hanford site and the Savannah River site (SRS), to re-determine the plutonium content of the material. These experiments were never completed, either because of experimental difficulties, or because of the inability to perform work due to the “stand-down” of NBL plutonium laboratory operations. Instead, NBL reviewed the results of the 1995 and 1999 characterization experiments, and recently decided to issue a Working Reference Material Certificate, based on the results already determined for plutonium assay, plutonium isotopic abundance, and  $^{241}\text{Am}$  abundance. The values to be shown in

the certificate will be presented at the July 2006 Measurement Evaluation Program Annual Meeting in Nashville, TN. LANL personnel will scrutinize these values before the final Certificate is issued in August 2006. LANL, Lawrence Livermore National Laboratory (LLNL), Fluor Hanford (Hanford), and SRS will be urged to make calorimetry and gamma spectrometry measurements of Calex 2 during July 2006-June 2007, and the results will be evaluated against the newly-certified reference values.

### **C. PARTICIPATING DOE FACILITIES**

LLNL and Hanford participated in the CY 2005 CALEX program. SRS and LANL did not submit results this year; these two laboratories will be urged to rejoin the CALEX Program next year, since it is essential to develop a good measurement-results database for both Calex 1 and Calex 2.

LLNL and Hanford followed their own procedures in making calorimetric power measurements and Pu and <sup>241</sup>Am isotopic abundance measurements. There were differences in measurement duration, measurement frequency, and calibration procedures. Under these circumstances, direct inter-laboratory comparison of results is of limited value. Nonetheless, the CALEX Program is able to provide performance evaluation for accuracy and precision attained in routine Nuclear Materials Control and Accountability measurements.

### **D. EVALUATION OF CY 2005 RESULTS AND REPORTING FORMAT**

This section provides a brief description of the statistical evaluation methods and the formats used in reporting results here.

- The facilities reported measurement results of calorimetric power and isotopic abundance (<sup>238</sup>Pu, <sup>239</sup>Pu, <sup>240</sup>Pu, <sup>241</sup>Pu, <sup>242</sup>Pu and <sup>241</sup>Am) to NBL. They also reported effective specific power ( $P_{\text{eff}}$ ) values: calculated as the sum of the products of measured isotopic abundances times the respective specific powers (Table 2).
- The results, except <sup>242</sup>Pu abundance, were entered into a FoxPro<sup>®</sup> database and checked for data entry errors. Ignoring <sup>242</sup>Pu is unlikely to alter significantly any of the results and conclusions presented in this report. Both data entry and



- verification were performed manually. NBL is developing new software for electronic transfer of data to minimize/eliminate transcription errors.
- The measured value for plutonium mass was a calculated quantity from measured results for power and  $P_{\text{eff}}$ .  $\text{Power}/P_{\text{eff}}$  yielded plutonium mass.
  - The measured values of plutonium mass, calorimetric power,  $P_{\text{eff}}$ , and isotope abundance were compared against accepted reference values. The accepted reference values were calculated from characterized values (Table 1) with appropriate corrections for radioactive decay, using the half-life values shown in Table 2.
  - The measurement results were evaluated in terms of measured/accepted ratio (M/A), measured minus accepted difference (M-A), and percent relative difference (% RD). The % RD was calculated using the following equation:

$$\% \text{ RD} = ((\text{Measured value} - \text{Accepted value})/\text{Accepted value}) \times 100.$$

- The mean for each of the three quantities (M/A, M-A, and % RD), the standard deviation ( $\sigma$ ), and the standard error of the mean ( $\sigma/\sqrt{n}$ , where n refers to the number of measurements) were calculated for the whole-year data and also for every calendar quarter. In this report the standard error of the mean ( $\sigma/\sqrt{n}$ ) is referred to as the standard uncertainty.

The evaluation results are presented in the form of tables and graphs. There are three types of tables (see items 1, 3 and 6 below) and three types of graphs (see items 2, 4 and 5 below):

1. Quarterly summary tables: these tables summarize the results of evaluation of power,  $P_{\text{eff}}$  and isotopic abundance measurements made in every calendar quarter by each facility in 2005. The quarterly means of M-A and % RD are reported, along with respective standard deviations and standard uncertainties. In addition, the table contains a comparison of results from the present quarter with those from the immediately preceding quarter. No quarterly summaries are presented for Pu mass.

2. Quarterly graphs for each facility: these figures show the quarterly variation of M/A values. The results for all four quarters are shown in the same graph, suitably offset to show the differences quarter by quarter. The uncertainties reported by the facilities are shown as vertical lines. The mean M/A values and uncertainties obtained from statistical evaluation are shown as horizontal lines. The middle horizontal line represents the mean for the quarter and the envelopes represent the uncertainty. In these graphs, M/A values of 1 indicate no difference between measured and accepted values. Quarterly graphs are presented for power,  $P_{\text{eff}}$  and isotopic abundance measurements. No quarterly graphs are presented for Pu mass.
3. Annual summary tables: these tables summarize the evaluation results of plutonium mass, power,  $P_{\text{eff}}$  and isotopic abundance measurements made by each facility during 2005. The annual means of M-A and % RD are reported along with standard deviations and standard uncertainties. In addition, the table contains a comparison of results for the current year (2005) with those from the immediately preceding year (2004).
4. Annual graphs: in these graphs % RDs and 95 % confidence intervals (computed as  $\pm$  twice the standard uncertainty) are displayed for each facility. These graphs are not meant to be used as inter-laboratory comparison graphs for reasons mentioned earlier (differences between facilities in measurement duration, measurement frequency, and calibration procedures). A 95 % confidence interval that includes zero indicates a % RD that is not significantly different from zero (i.e., no statistically significant difference between the measured and accepted values).
5. Annual graphs for each facility: these figures show annual variation of M/A values, and constructed in a manner similar to quarterly graphs.
6. Whole year data tables for each facility: these tables contain the original data submitted by the facility--measurement date, instrument used, measured value (M), and the uncertainty in the measured value as estimated by the facility. These tables also contain accepted values (A) calculated from characterized values in Table 1 with appropriate corrections for radioactive decay, M/A ratio, M-A difference, and % RD.

## E. CONCLUSIONS

Only two DOE facilities (Hanford and LLNL) participated in the CALEX Program this year. The Calex 1 results submitted by them are evaluated in Table 3. The evaluation is done through % RD values for plutonium mass, power, isotope abundance and  $P_{\text{eff}}$ . A zero value of % RD indicates no difference between measured and accepted values; a positive % RD indicates over estimation in the experimental measurement, and a negative % RD indicates under estimation. Note that SRS and LANL did not participate in the CALEX Program this year.

**Table 3. Performance evaluation of Calex 1 measurement results from Hanford and LLNL. The % RDs are shown along with 95 % confidence intervals (i.e.,  $\pm$  twice the standard uncertainty).**

| Measured Quantity | % RD             |                  |
|-------------------|------------------|------------------|
|                   | Hanford          | LLNL             |
| Pu mass           | -0.42 $\pm$ 0.14 | 0.01 $\pm$ 0.11  |
| Power             | -0.41 $\pm$ 0.12 | -0.07 $\pm$ 0.08 |
| $P_{\text{eff}}$  | -0.12 $\pm$ 0.04 | -0.16 $\pm$ 0.03 |
| $^{238}\text{Pu}$ | -4.46 $\pm$ 1.23 | -2.36 $\pm$ 1.00 |
| $^{239}\text{Pu}$ | -0.02 $\pm$ 0.01 | 0.00 $\pm$ 0.01  |
| $^{240}\text{Pu}$ | 0.44 $\pm$ 0.17  | -0.07 $\pm$ 0.12 |
| $^{241}\text{Pu}$ | 0.31 $\pm$ 0.14  | -0.03 $\pm$ 0.15 |
| $^{241}\text{Am}$ | -0.43 $\pm$ 0.10 | -0.59 $\pm$ 0.12 |

The following conclusions emerge from an examination of the results shown in Table 3:

- Hanford and LLNL were able to measure the plutonium mass in Calex 1 within about 0.5%. Similar results were obtained in the CY 2004 program. The LLNL result for Pu mass shows no bias in CY 2005, whereas CY 2004 results showed a

positive bias. Hanford results show a negative bias for CY 2005, similar to CY 2004.

- Hanford power measurements show a negative bias while LLNL shows no bias.
- $P_{\text{eff}}$  values from both Hanford and LLNL show a negative bias. Evaluating  $P_{\text{eff}}$  is equivalent to collective evaluation of isotope abundance measurement results.

#### **F. PLANS FOR JULY 2006 TO JUNE 2007**

- The Working Reference Material Certificate for Calex 2 will be issued in August 2006. The Calex 2 standard is an important reference material standard for calorimetry, and is expected to become an important standard in neutron multiplicity measurements.
- The Calex 2 measurements done so far by LLNL and Hanford will be evaluated in 2007 along with the new results.
- LANL, LLNL, Hanford and SRS will be urged to make a number of Calex 2 measurements between July 2006 and June 2007.
- LANL and SRS missed submitting Calex 1 data this year; they will be urged to participate fully next year.
- A new database application will be developed that will permit laboratories to submit their measurement results electronically via the internet.

**G. Pu MASS TABLES AND GRAPHS**



**RESULTS OF ANALYSIS OF Pu MASS DATA  
2005**

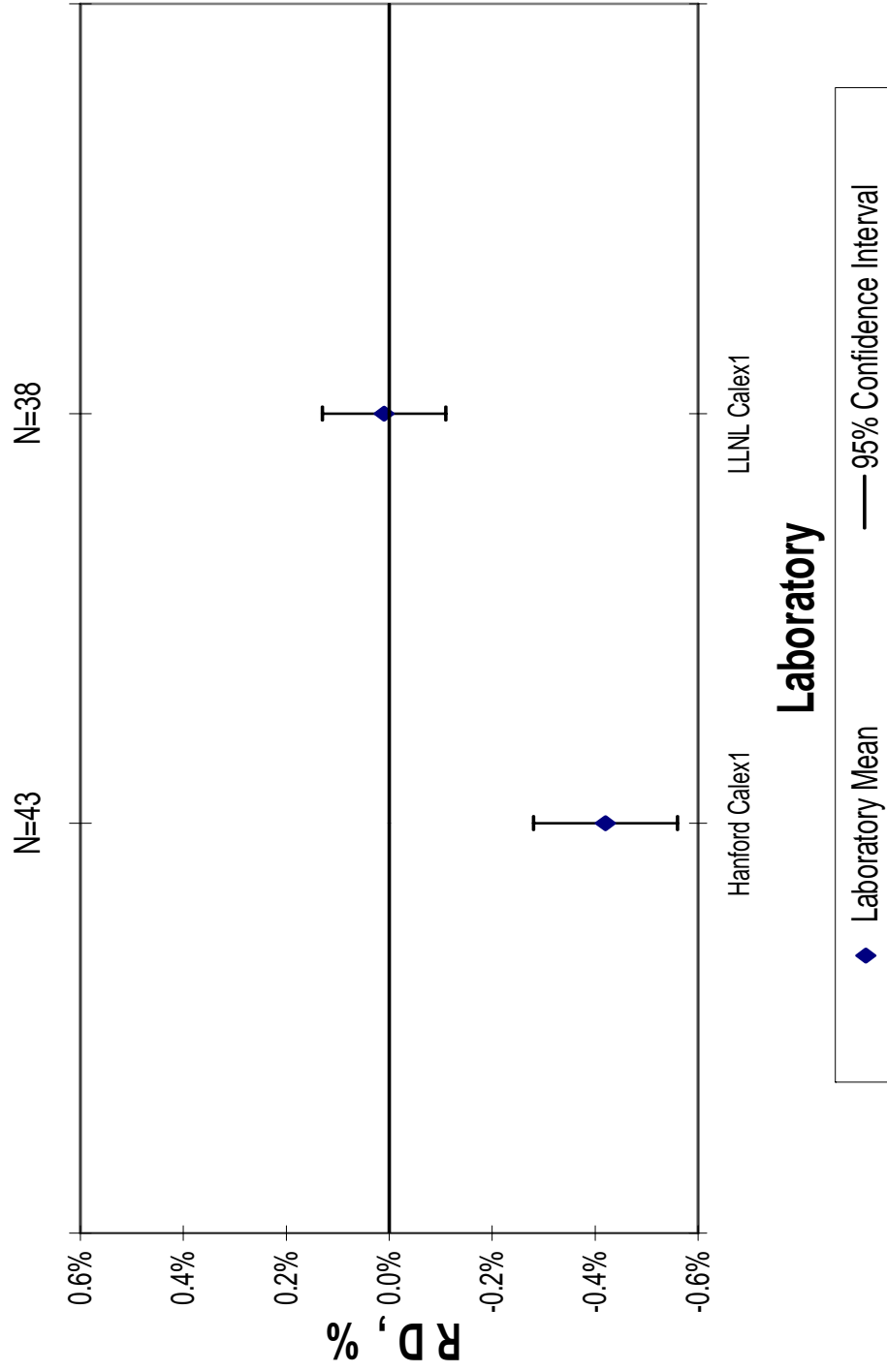
Hanford Calex 1 LLNL Calex 1

|                             |        |       |
|-----------------------------|--------|-------|
| Mean error (g)              | -1.678 | 0.050 |
| Standard deviation(g)       | 1.759  | 1.375 |
| Uncertainty in the Mean (g) | 0.268  | 0.223 |
| Mean Error (%)              | -0.42% | 0.01% |
| Standard Deviation (%)      | 0.44%  | 0.35% |
| Uncertainty in the Mean (%) | 0.07%  | 0.06% |
| Number of Data Points       | 43     | 38    |
| Number of Outliers          | 0      | 0     |

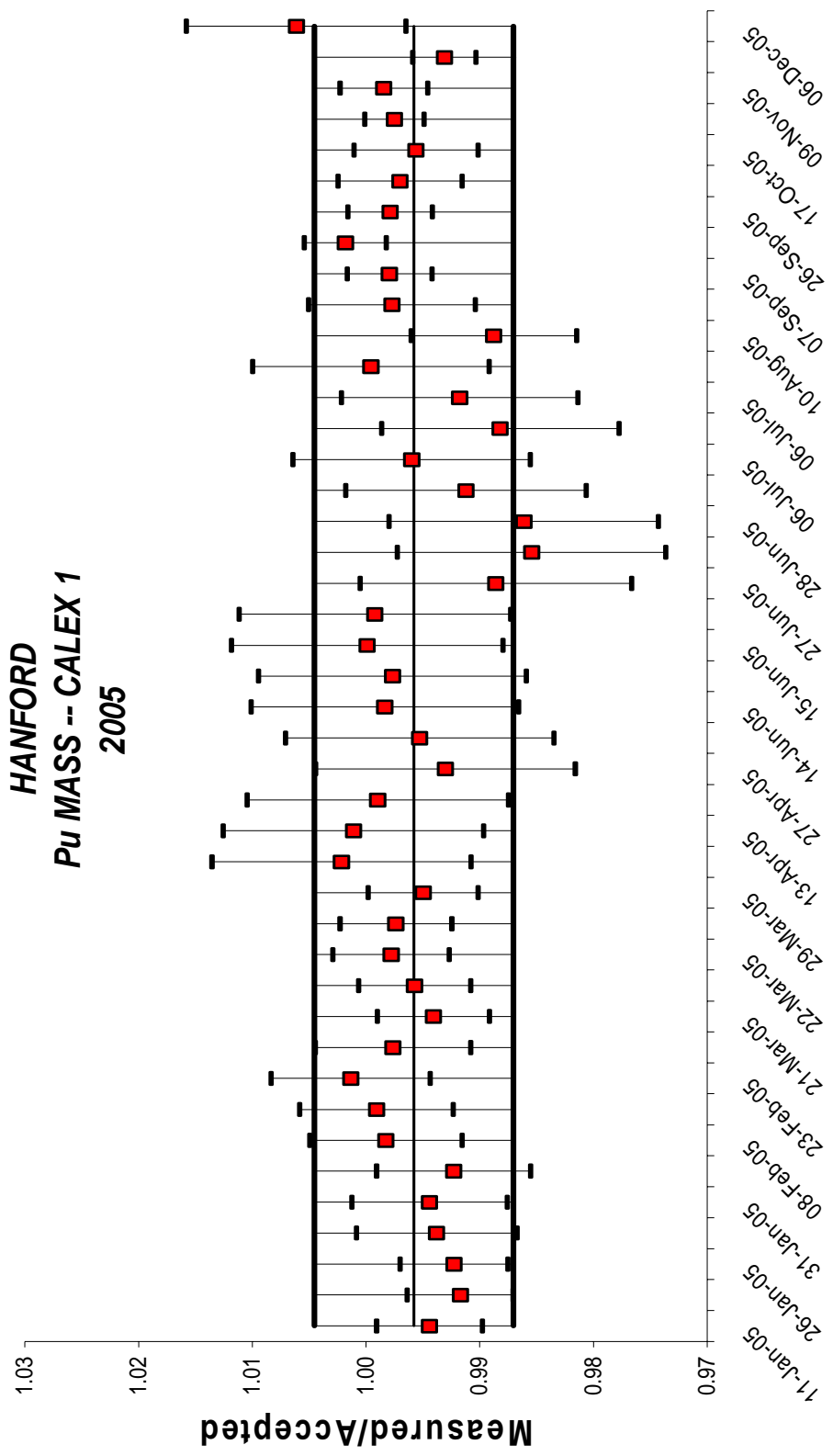
**Difference from Last Year in:**

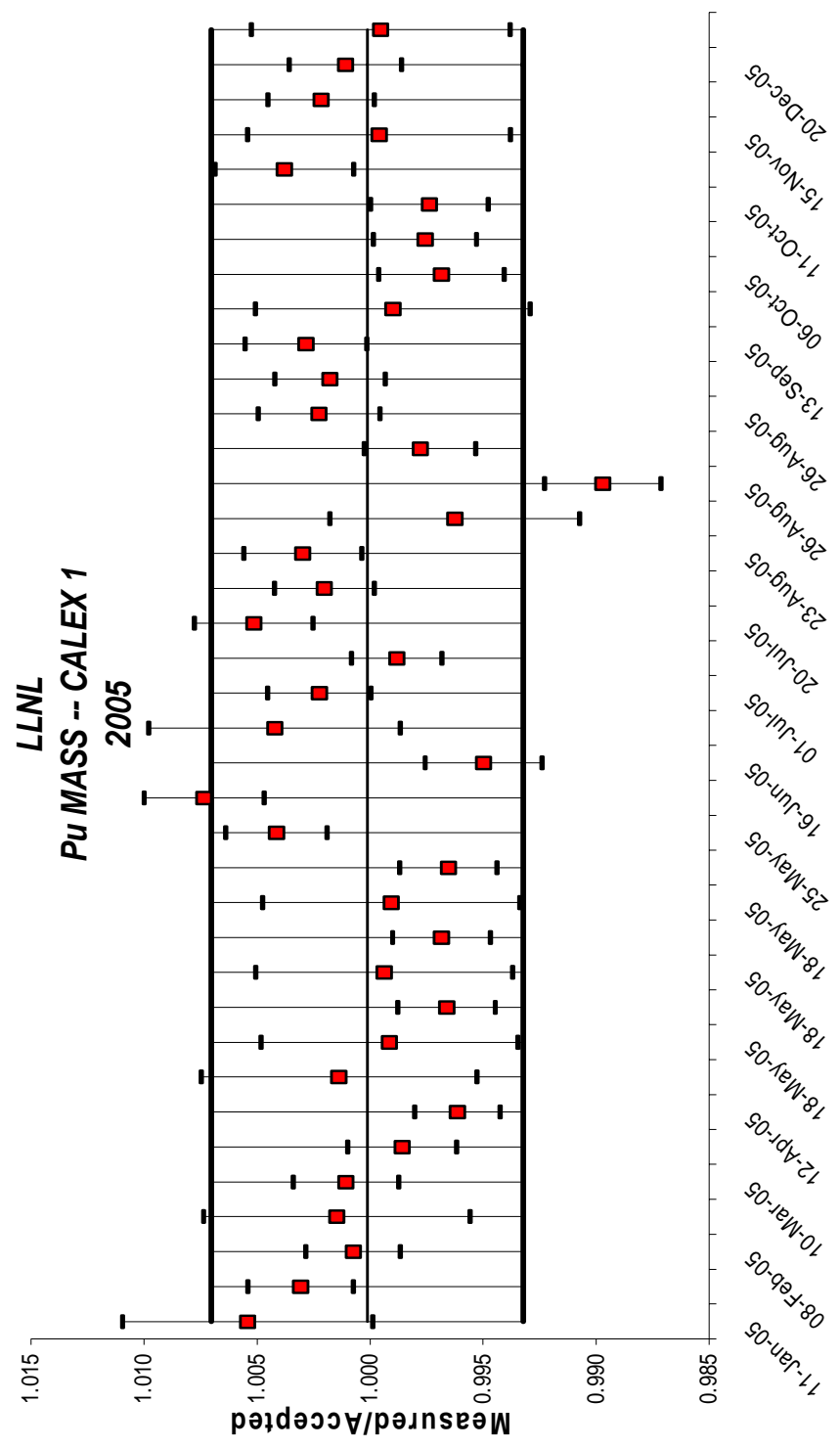
|                             |        |        |
|-----------------------------|--------|--------|
| Mean error (g)              | -0.464 | -0.573 |
| Standard deviation(g)       | 0.183  | 0.411  |
| Uncertainty in the Mean (g) | 0.009  | 0.082  |
| Mean Error (%)              | -0.11% | -0.15% |
| Standard Deviation (%)      | 0.04%  | 0.11%  |
| Uncertainty in the Mean (%) | 0.00%  | 0.02%  |
| Number of Data Points       | 6      | -9     |
| Number of Outliers          | 0      | 0      |

# New Brunswick Laboratory Calorimetry Exchange Program Pu Mass, 2005









**Pu MASS DATA**  
**Calendar Year 2005**

**Hanford: Calex 1**

| #  | Date Measured | Instr. ID | Measured Mass | Uncert. 1 STD | Accepted Mass   | Ratio M/A | Grams Error | Percent Error |
|----|---------------|-----------|---------------|---------------|-----------------|-----------|-------------|---------------|
| 1  | 11-Jan-05     | 2740 - 9  | 395.60        | 0.23%         | 397.83          | 0.9944    | -2.23       | -0.56%        |
| 2  | 25-Jan-05     | 2026 - 10 | 394.53        | 0.23%         | 397.83          | 0.9917    | -3.30       | -0.83%        |
| 3  | 26-Jan-05     | 2740 - 10 | 394.74        | 0.24%         | 397.83          | 0.9922    | -3.09       | -0.78%        |
| 4  | 31-Jan-05     | 2424 - 8  | 395.35        | 0.35%         | 397.83          | 0.9938    | -2.48       | -0.62%        |
| 5  | 31-Jan-05     | 2026 - 8  | 395.60        | 0.34%         | 397.83          | 0.9944    | -2.24       | -0.56%        |
| 6  | 01-Feb-05     | 2740 - 8  | 394.75        | 0.34%         | 397.83          | 0.9923    | -3.07       | -0.77%        |
| 7  | 08-Feb-05     | 2740 - 9  | 397.12        | 0.34%         | 397.83          | 0.9982    | -0.71       | -0.18%        |
| 8  | 17-Feb-05     | 2026 - 9  | 397.46        | 0.34%         | 397.83          | 0.9991    | -0.37       | -0.09%        |
| 9  | 23-Feb-05     | 2424 - 10 | 398.35        | 0.35%         | 397.83          | 1.0013    | 0.52        | 0.13%         |
| 10 | 23-Feb-05     | 2026 - 10 | 396.88        | 0.34%         | 397.83          | 0.9976    | -0.95       | -0.24%        |
| 11 | 21-Mar-05     | 2026 - 8  | 395.46        | 0.25%         | 397.83          | 0.9941    | -2.37       | -0.59%        |
| 12 | 21-Mar-05     | 2740 - 8  | 396.12        | 0.25%         | 397.83          | 0.9957    | -1.71       | -0.43%        |
| 13 | 22-Mar-05     | 2424 - 8  | 396.94        | 0.26%         | 397.83          | 0.9978    | -0.89       | -0.22%        |
| 14 | 29-Mar-05     | 2424 - 9  | 396.77        | 0.25%         | 397.83          | 0.9974    | -1.05       | -0.26%        |
| 15 | 29-Mar-05     | 2740 - 9  | 395.82        | 0.24%         | 397.83          | 0.9950    | -2.01       | -0.50%        |
| 16 | 12-Apr-05     | 2740 - 9  | 398.67        | 0.57%         | 397.83          | 1.0021    | 0.85        | 0.21%         |
| 17 | 13-Apr-05     | 2424 - 9  | 398.26        | 0.57%         | 397.82          | 1.0011    | 0.43        | 0.11%         |
| 18 | 20-Apr-05     | 2424 - 7  | 397.40        | 0.57%         | 397.82          | 0.9989    | -0.42       | -0.11%        |
| 19 | 27-Apr-05     | 2026 - 9  | 395.04        | 0.57%         | 397.82          | 0.9930    | -2.79       | -0.70%        |
| 20 | 13-Jun-05     | 2026 - 7  | 395.93        | 0.59%         | 397.82          | 0.9953    | -1.89       | -0.47%        |
| 21 | 14-Jun-05     | 2740 - 10 | 397.15        | 0.59%         | 397.82          | 0.9983    | -0.66       | -0.17%        |
| 22 | 14-Jun-05     | 2740 - 7  | 396.88        | 0.59%         | 397.82          | 0.9977    | -0.93       | -0.23%        |
| 23 | 15-Jun-05     | 2424 - 10 | 397.77        | 0.60%         | 397.82          | 0.9999    | -0.04       | -0.01%        |
| 24 | 15-Jun-05     | 2424 - 7  | 397.50        | 0.60%         | 397.82          | 0.9992    | -0.31       | -0.08%        |
| 25 | 27-Jun-05     | 2424 - 8  | 393.26        | 0.60%         | 397.82          | 0.9886    | -4.55       | -1.14%        |
| 26 | 28-Jun-05     | 2026 - 8  | 392.02        | 0.59%         | 397.82          | 0.9854    | -5.80       | -1.46%        |
| 27 | 28-Jun-05     | 2740 - 8  | 392.29        | 0.59%         | 397.82          | 0.9861    | -5.53       | -1.39%        |
| 28 | 05-Jul-05     | 2424 - 7  | 394.31        | 0.53%         | 397.82          | 0.9912    | -3.51       | -0.88%        |
| 29 | 06-Jul-05     | 2026 - 9  | 396.21        | 0.52%         | 397.81          | 0.9960    | -1.61       | -0.40%        |
| 30 | 06-Jul-05     | 2026 - 7  | 393.12        | 0.52%         | 397.81          | 0.9882    | -4.70       | -1.18%        |
| 31 | 06-Jul-05     | 2740 - 7  | 394.53        | 0.52%         | 397.81          | 0.9918    | -3.28       | -0.82%        |
| 32 | 06-Jul-05     | 2740 - 9  | 397.64        | 0.52%         | 397.81          | 0.9996    | -0.17       | -0.04%        |
| 33 | 10-Aug-05     | 2740 - 10 | 393.33        | 0.36%         | 397.81          | 0.9887    | -4.48       | -1.13%        |
| 34 | 30-Aug-05     | 2026 - 8  | 396.89        | 0.37%         | 397.81          | 0.9977    | -0.92       | -0.23%        |
| 35 | 07-Sep-05     | 2740 - 9  | 396.98        | 0.19%         | 397.81          | 0.9979    | -0.83       | -0.21%        |
| 36 | 26-Sep-05     | 2740 - 8  | 398.53        | 0.18%         | 397.81          | 1.0018    | 0.72        | 0.18%         |
| 37 | 26-Sep-05     | 2026 - 8  | 396.96        | 0.19%         | 397.81          | 0.9979    | -0.85       | -0.21%        |
| 38 | 17-Oct-05     | 2026 - 8  | 396.60        | 0.27%         | 397.81          | 0.9970    | -1.20       | -0.30%        |
| 39 | 17-Oct-05     | 2740 - 8  | 396.05        | 0.27%         | 397.81          | 0.9956    | -1.76       | -0.44%        |
| 40 | 08-Nov-05     | 2740 - 9  | 396.80        | 0.13%         | 397.81          | 0.9975    | -1.00       | -0.25%        |
| 41 | 09-Nov-05     | 2347 - 9  | 397.17        | 0.19%         | 397.80          | 0.9984    | -0.63       | -0.16%        |
| 42 | 17-Nov-05     | 2347 - 7  | 395.05        | 0.14%         | 397.80          | 0.9931    | -2.75       | -0.69%        |
| 43 | 06-Dec-05     | 2740 - 10 | 400.23        | 0.48%         | 397.80          | 1.0061    | 2.43        | 0.61%         |
|    |               |           |               |               | Mean:           | 0.9958    | -1.678      | -0.42%        |
|    |               |           |               |               | Std. Deviation: | 0.0044    | 1.759       | 0.44%         |
|    |               |           |               |               | Std Error:      | 0.0007    | 0.268       | 0.07%         |

**Pu MASS DATA**  
**Calendar Year 2005**

LLNL: Calex 1

| #               | Date<br>Measured | Instr.<br>ID | Measured<br>Mass | Uncert.<br>1 STD | Accepted<br>Mass | Ratio<br>M/A | Grams<br>Error | Percent<br>Error |
|-----------------|------------------|--------------|------------------|------------------|------------------|--------------|----------------|------------------|
| 1               | 11-Jan-05        | 2 - 33       | 399.98           | 0.28%            | 397.83           | 1.0054       | 2.15           | 0.54%            |
| 2               | 18-Jan-05        | 3 - 18       | 399.05           | 0.12%            | 397.83           | 1.0031       | 1.22           | 0.31%            |
| 3               | 08-Feb-05        | 2 - 32       | 398.12           | 0.10%            | 397.83           | 1.0007       | 0.29           | 0.07%            |
| 4               | 28-Feb-05        | 1 - 33       | 398.41           | 0.29%            | 397.83           | 1.0015       | 0.58           | 0.15%            |
| 5               | 10-Mar-05        | 2 - 30       | 398.25           | 0.12%            | 397.83           | 1.0011       | 0.42           | 0.11%            |
| 6               | 12-Apr-05        | 1 - 18       | 397.26           | 0.12%            | 397.82           | 0.9986       | -0.57          | -0.14%           |
| 7               | 12-Apr-05        | 1 - 30       | 396.29           | 0.09%            | 397.82           | 0.9961       | -1.54          | -0.39%           |
| 8               | 18-Apr-05        | 3 - 33       | 398.37           | 0.30%            | 397.82           | 1.0014       | 0.55           | 0.14%            |
| 9               | 18-May-05        | 1 - 33       | 397.48           | 0.28%            | 397.82           | 0.9991       | -0.34          | -0.09%           |
| 10              | 18-May-05        | 1 - 18       | 396.47           | 0.11%            | 397.82           | 0.9966       | -1.35          | -0.34%           |
| 11              | 18-May-05        | 1 - 33       | 397.57           | 0.28%            | 397.82           | 0.9994       | -0.25          | -0.06%           |
| 12              | 18-May-05        | 1 - 18       | 396.56           | 0.11%            | 397.82           | 0.9968       | -1.26          | -0.32%           |
| 13              | 18-May-05        | 1 - 33       | 397.45           | 0.28%            | 397.82           | 0.9991       | -0.37          | -0.09%           |
| 14              | 18-May-05        | 1 - 18       | 396.44           | 0.11%            | 397.82           | 0.9965       | -1.38          | -0.35%           |
| 15              | 25-May-05        | 3 - 30       | 399.47           | 0.11%            | 397.82           | 1.0041       | 1.65           | 0.41%            |
| 16              | 07-Jun-05        | 3 - 18       | 400.74           | 0.13%            | 397.82           | 1.0073       | 2.92           | 0.73%            |
| 17              | 16-Jun-05        | 1 - 30       | 395.82           | 0.13%            | 397.82           | 0.9950       | -2.00          | -0.50%           |
| 18              | 16-Jun-05        | 1 - 33       | 399.50           | 0.28%            | 397.82           | 1.0042       | 1.68           | 0.42%            |
| 19              | 01-Jul-05        | 1 - 30       | 398.71           | 0.11%            | 397.82           | 1.0022       | 0.89           | 0.22%            |
| 20              | 14-Jul-05        | 1 - 30       | 397.34           | 0.10%            | 397.82           | 0.9988       | -0.47          | -0.12%           |
| 21              | 20-Jul-05        | 3 - 18       | 399.86           | 0.13%            | 397.82           | 1.0051       | 2.04           | 0.51%            |
| 22              | 20-Jul-05        | 3 - 32       | 398.62           | 0.11%            | 397.82           | 1.0020       | 0.80           | 0.20%            |
| 23              | 23-Aug-05        | 1 - 30       | 398.99           | 0.13%            | 397.81           | 1.0030       | 1.18           | 0.30%            |
| 24              | 23-Aug-05        | 1 - 33       | 396.32           | 0.28%            | 397.81           | 0.9962       | -1.49          | -0.38%           |
| 25              | 26-Aug-05        | 1 - 18       | 393.71           | 0.13%            | 397.81           | 0.9897       | -4.10          | -1.03%           |
| 26              | 26-Aug-05        | 1 - 32       | 396.93           | 0.12%            | 397.81           | 0.9978       | -0.88          | -0.22%           |
| 27              | 26-Aug-05        | 1 - 18       | 398.71           | 0.13%            | 397.81           | 1.0023       | 0.90           | 0.23%            |
| 28              | 13-Sep-05        | 1 - 32       | 398.51           | 0.12%            | 397.81           | 1.0018       | 0.70           | 0.18%            |
| 29              | 13-Sep-05        | 1 - 18       | 398.94           | 0.13%            | 397.81           | 1.0028       | 1.13           | 0.28%            |
| 30              | 06-Oct-05        | 3 - 33       | 397.40           | 0.30%            | 397.81           | 0.9990       | -0.40          | -0.10%           |
| 31              | 06-Oct-05        | 3 - 30       | 396.55           | 0.14%            | 397.81           | 0.9968       | -1.26          | -0.32%           |
| 32              | 11-Oct-05        | 3 - 30       | 396.84           | 0.11%            | 397.81           | 0.9976       | -0.97          | -0.24%           |
| 33              | 11-Oct-05        | 3 - 18       | 396.76           | 0.13%            | 397.81           | 0.9974       | -1.05          | -0.26%           |
| 34              | 15-Nov-05        | 1 - 18       | 399.31           | 0.15%            | 397.80           | 1.0038       | 1.51           | 0.38%            |
| 35              | 15-Nov-05        | 1 - 33       | 397.64           | 0.29%            | 397.80           | 0.9996       | -0.16          | -0.04%           |
| 36              | 07-Dec-05        | 2 - 18       | 398.66           | 0.12%            | 397.80           | 1.0022       | 0.86           | 0.22%            |
| 37              | 20-Dec-05        | 2 - 32       | 398.23           | 0.12%            | 397.80           | 1.0011       | 0.43           | 0.11%            |
| 38              | 20-Dec-05        | 2 - 33       | 397.61           | 0.29%            | 397.80           | 0.9995       | -0.19          | -0.05%           |
| Mean:           |                  |              |                  |                  |                  | 1.0001       | 0.050          | 0.01%            |
| Std. Deviation: |                  |              |                  |                  |                  | 0.0035       | 1.375          | 0.35%            |
| Std Error:      |                  |              |                  |                  |                  | 0.0006       | 0.223          | 0.06%            |

## H. POWER MEASUREMENTS TABLES AND GRAPHS



**RESULTS OF ANALYSIS OF POWER DATA**  
**1st QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                              |        |       |
|------------------------------|--------|-------|
| Mean error (mW)              | -3.972 | 0.692 |
| Standard deviation(mW)       | 2.963  | 2.043 |
| Uncertainty in the Mean (mW) | 0.855  | 0.567 |
| Mean Error (%)               | -0.39% | 0.07% |
| Standard Deviation (%)       | 0.29%  | 0.20% |
| Uncertainty in the Mean (%)  | 0.08%  | 0.06% |
| Number of Data Points        | 12     | 13    |
| Number of Outliers           | 0      | 0     |

**Difference from Last Quarter in:**

|                              |        |        |
|------------------------------|--------|--------|
| Mean error (mW)              | 3.677  | 0.764  |
| Standard deviation(mW)       | -0.411 | -0.554 |
| Uncertainty in the Mean (mW) | -0.832 | -0.063 |
| Mean Error (%)               | 0.35%  | 0.08%  |
| Standard Deviation (%)       | -0.04% | -0.05% |
| Uncertainty in the Mean (%)  | -0.08% | 0.00%  |
| Number of Data Points        | 8      | -4     |
| Number of Outliers           | -3     | -1     |

**RESULTS OF ANALYSIS OF POWER DATA**  
**2nd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                              |        |        |
|------------------------------|--------|--------|
| Mean error (mW)              | -4.922 | -1.019 |
| Standard deviation(mW)       | 5.292  | 3.503  |
| Uncertainty in the Mean (mW) | 2.160  | 0.904  |
| Mean Error (%)               | -0.48% | -0.10% |
| Standard Deviation (%)       | 0.51%  | 0.34%  |
| Uncertainty in the Mean (%)  | 0.21%  | 0.09%  |
| Number of Data Points        | 6      | 15     |
| Number of Outliers           | 1      | 0      |

**Difference from Last Quarter in:**

|                              |        |        |
|------------------------------|--------|--------|
| Mean error (mW)              | -0.950 | -1.711 |
| Standard deviation(mW)       | 2.329  | 1.460  |
| Uncertainty in the Mean (mW) | 1.305  | 0.337  |
| Mean Error (%)               | -0.09% | -0.17% |
| Standard Deviation (%)       | 0.22%  | 0.14%  |
| Uncertainty in the Mean (%)  | 0.13%  | 0.03%  |
| Number of Data Points        | -6     | 2      |
| Number of Outliers           | 1      | 0      |



**RESULTS OF ANALYSIS OF POWER DATA**  
**3rd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                              |        |        |
|------------------------------|--------|--------|
| Mean error (mW)              | -5.338 | -0.891 |
| Standard deviation(mW)       | 4.400  | 3.682  |
| Uncertainty in the Mean (mW) | 1.270  | 0.984  |
| Mean Error (%)               | -0.52% | -0.09% |
| Standard Deviation (%)       | 0.43%  | 0.36%  |
| Uncertainty in the Mean (%)  | 0.12%  | 0.10%  |
| Number of Data Points        | 12     | 14     |
| Number of Outliers           | 0      | 0      |

**Difference from Last Quarter in:**

|                              |        |       |
|------------------------------|--------|-------|
| Mean error (mW)              | -0.416 | 0.128 |
| Standard deviation(mW)       | -0.892 | 0.179 |
| Uncertainty in the Mean (mW) | -0.890 | 0.080 |
| Mean Error (%)               | -0.04% | 0.01% |
| Standard Deviation (%)       | -0.08% | 0.02% |
| Uncertainty in the Mean (%)  | -0.09% | 0.01% |
| Number of Data Points        | 6      | -1    |
| Number of Outliers           | -1     | 0     |

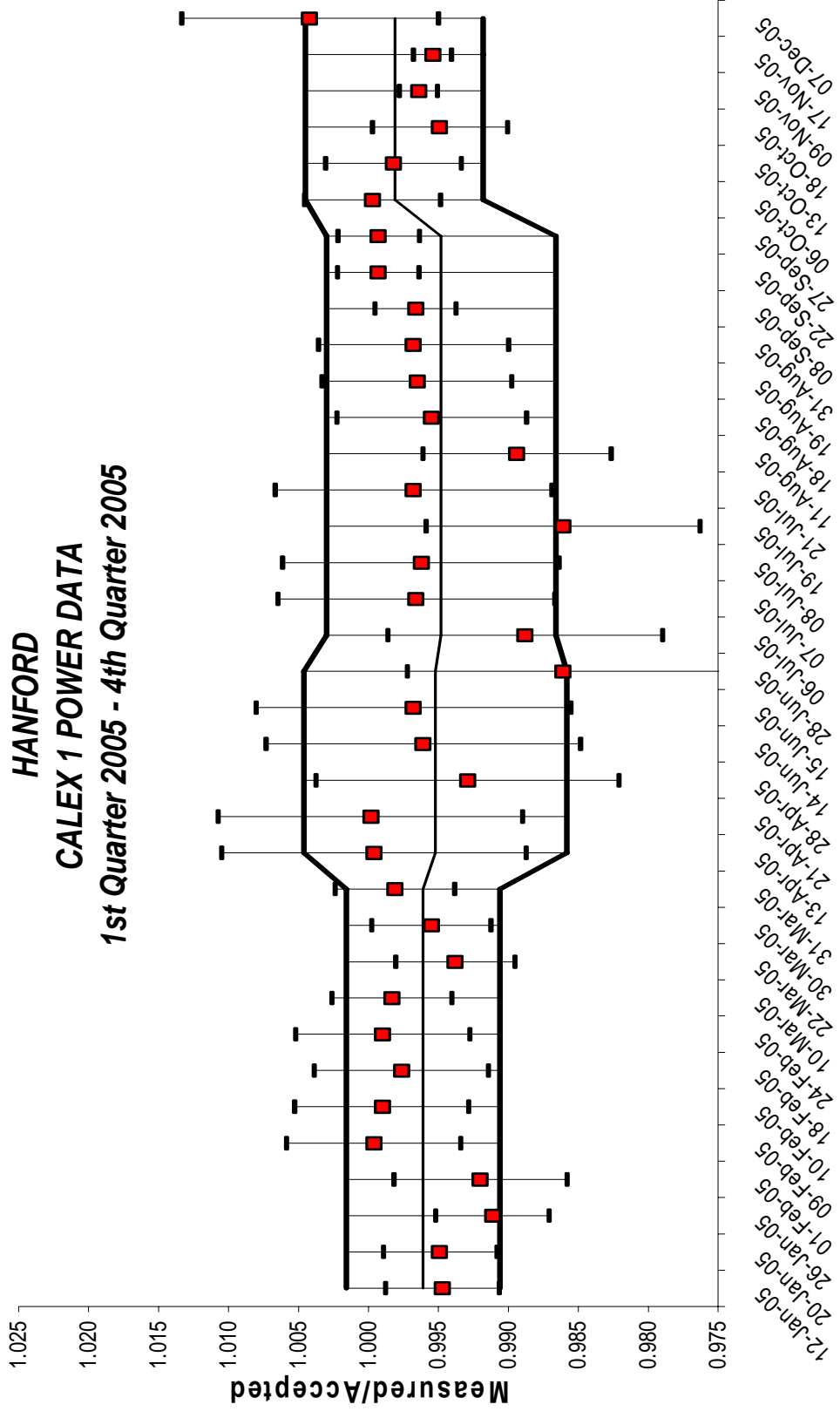
**RESULTS OF ANALYSIS OF POWER DATA  
4th QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

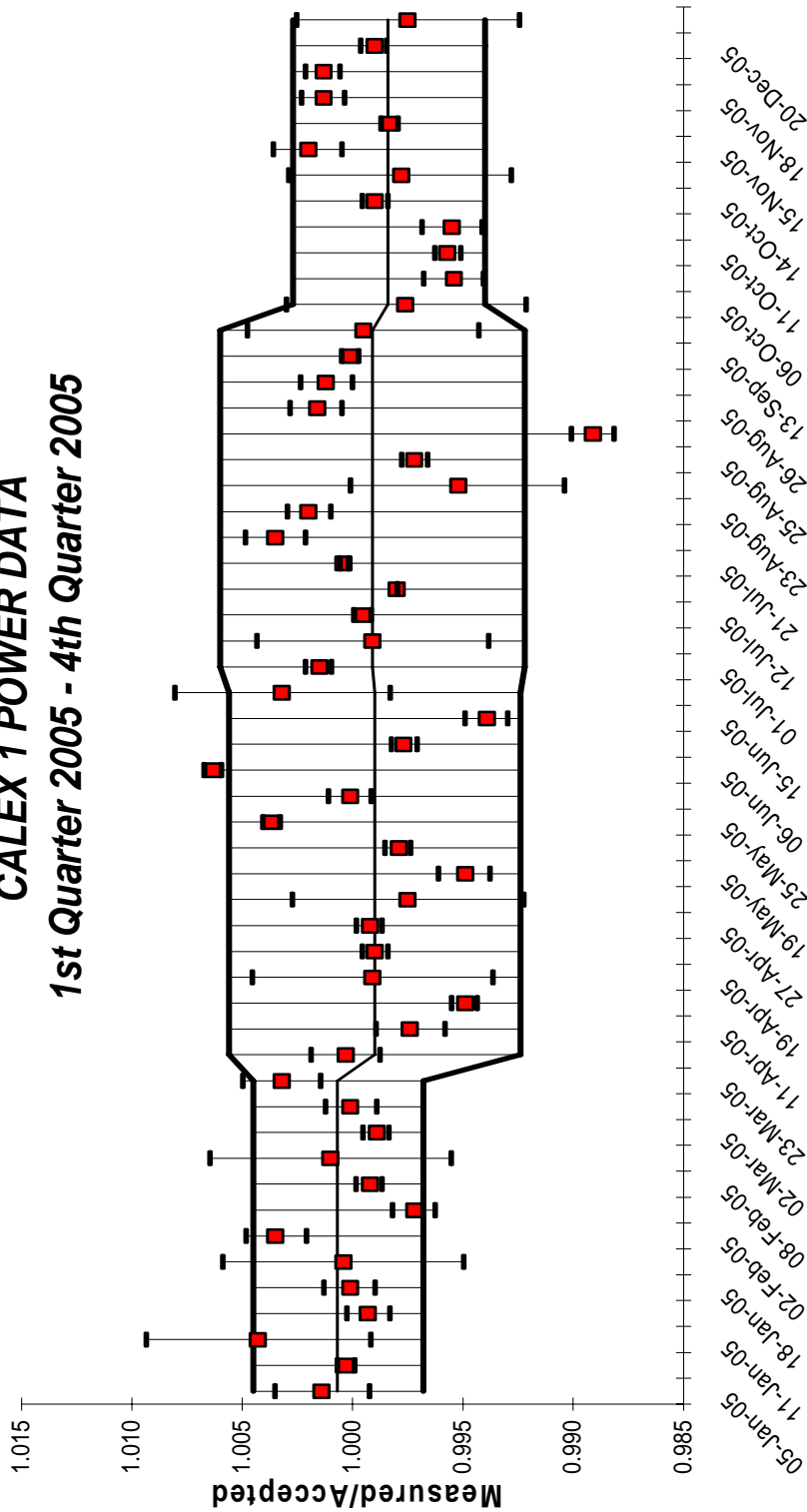
|                              |        |        |
|------------------------------|--------|--------|
| Mean error (mW)              | -1.927 | -1.670 |
| Standard deviation(mW)       | 3.555  | 2.358  |
| Uncertainty in the Mean (mW) | 1.451  | 0.681  |
| Mean Error (%)               | -0.19% | -0.16% |
| Standard Deviation (%)       | 0.35%  | 0.23%  |
| Uncertainty in the Mean (%)  | 0.14%  | 0.07%  |
| Number of Data Points        | 6      | 12     |
| Number of Outliers           | 0      | 0      |

**Difference from Last Quarter in:**

|                              |        |        |
|------------------------------|--------|--------|
| Mean error (mW)              | 3.411  | -0.779 |
| Standard deviation(mW)       | -0.845 | -1.324 |
| Uncertainty in the Mean (mW) | 0.181  | -0.303 |
| Mean Error (%)               | 0.33%  | -0.07% |
| Standard Deviation (%)       | -0.08% | -0.13% |
| Uncertainty in the Mean (%)  | 0.02%  | -0.03% |
| Number of Data Points        | -6     | -2     |
| Number of Outliers           | 0      | 0      |



**LAWRENCE LIVERMORE  
CALEX 1 POWER DATA  
1st Quarter 2005 - 4th Quarter 2005**



**RESULTS OF ANALYSIS OF POWER DATA  
2005**

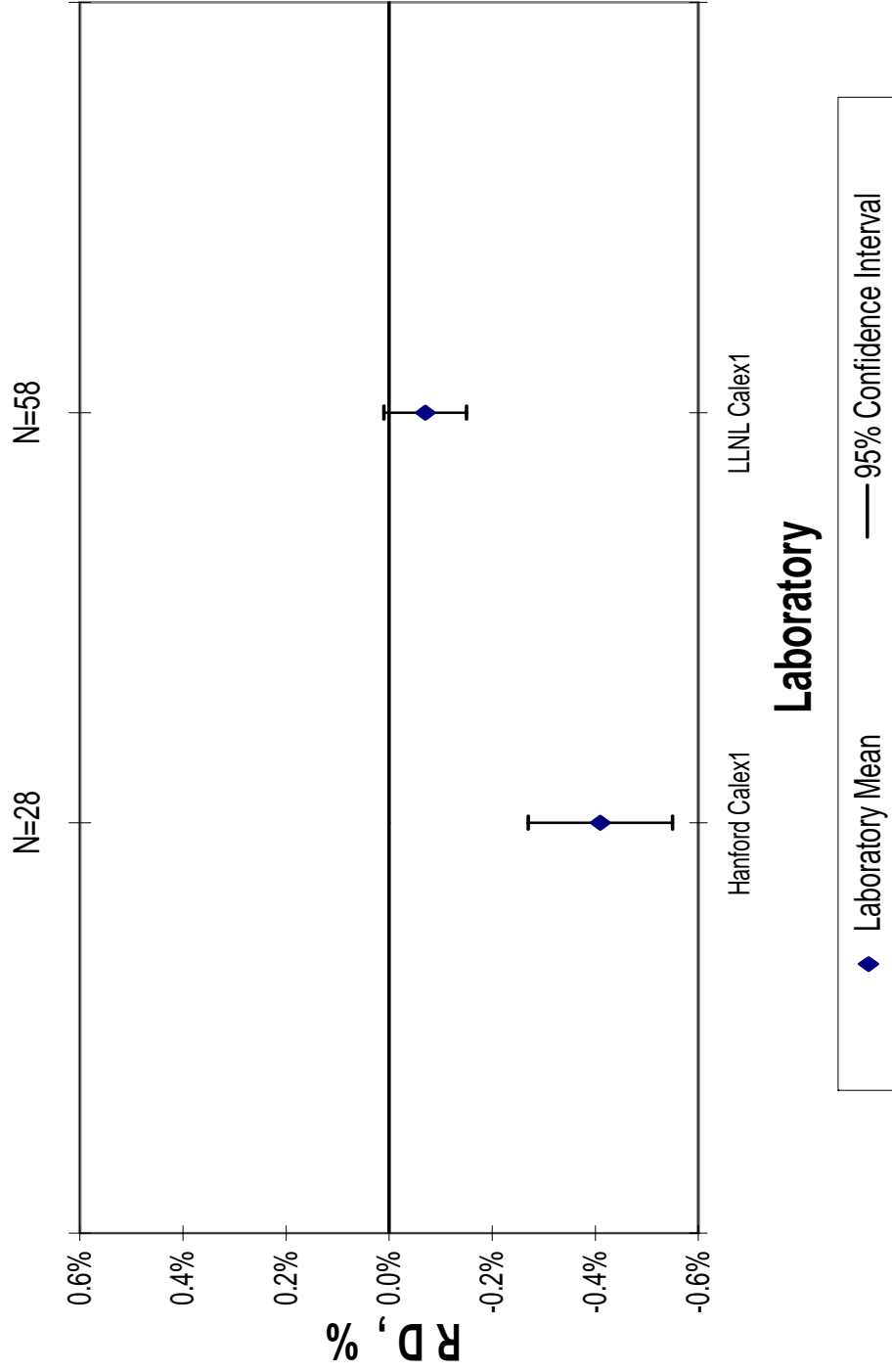
Hanford Calex 1 LLNL Calex 1

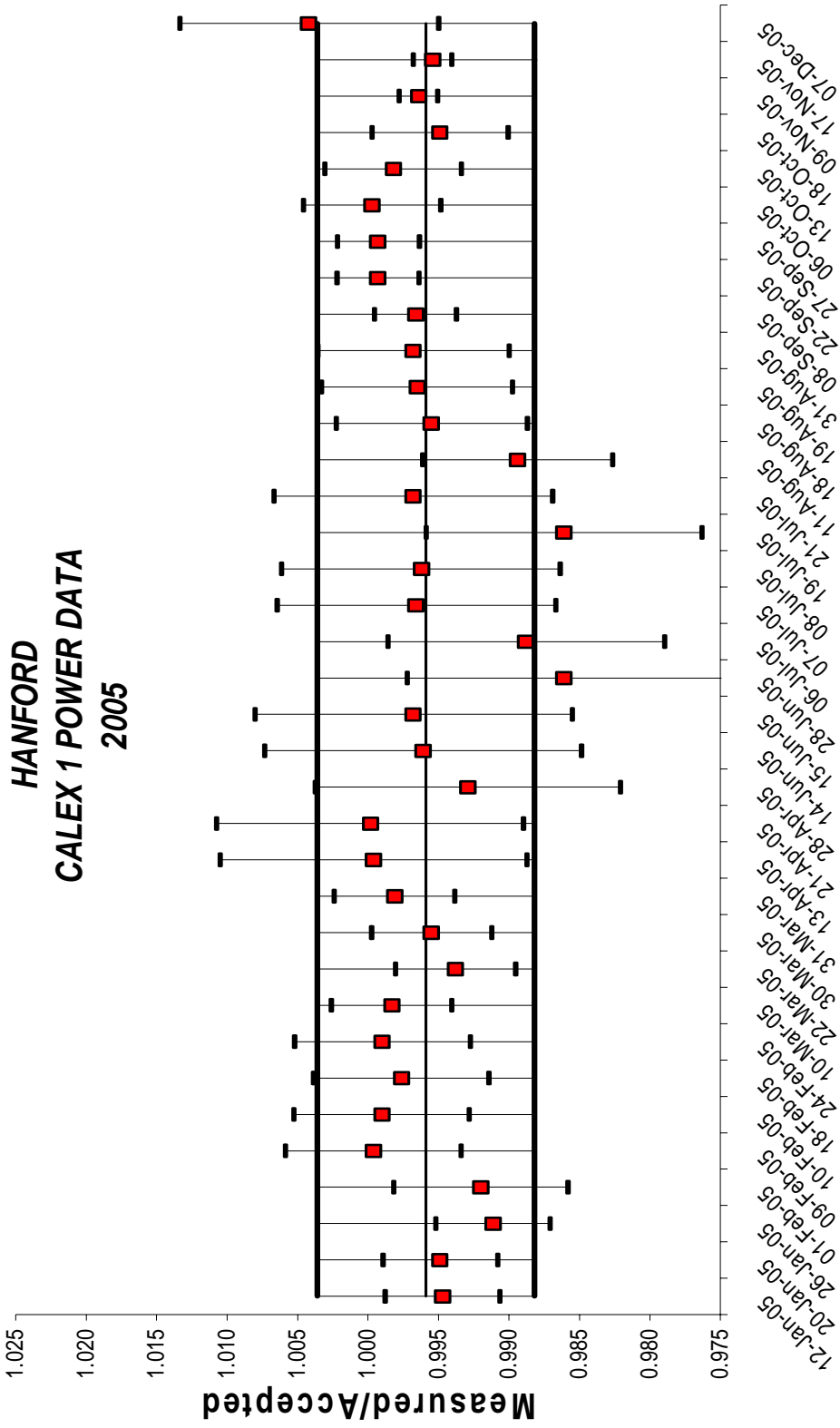
|                              |        |        |
|------------------------------|--------|--------|
| Mean error (mW)              | -4.245 | -0.719 |
| Standard deviation(mW)       | 4.010  | 3.065  |
| Uncertainty in the Mean (mW) | 0.668  | 0.417  |
| Mean Error (%)               | -0.41% | -0.07% |
| Standard Deviation (%)       | 0.39%  | 0.30%  |
| Uncertainty in the Mean (%)  | 0.07%  | 0.04%  |
| Number of Data Points        | 36     | 54     |
| Number of Outliers           | 1      | 0      |

**Difference from Last Year in:**

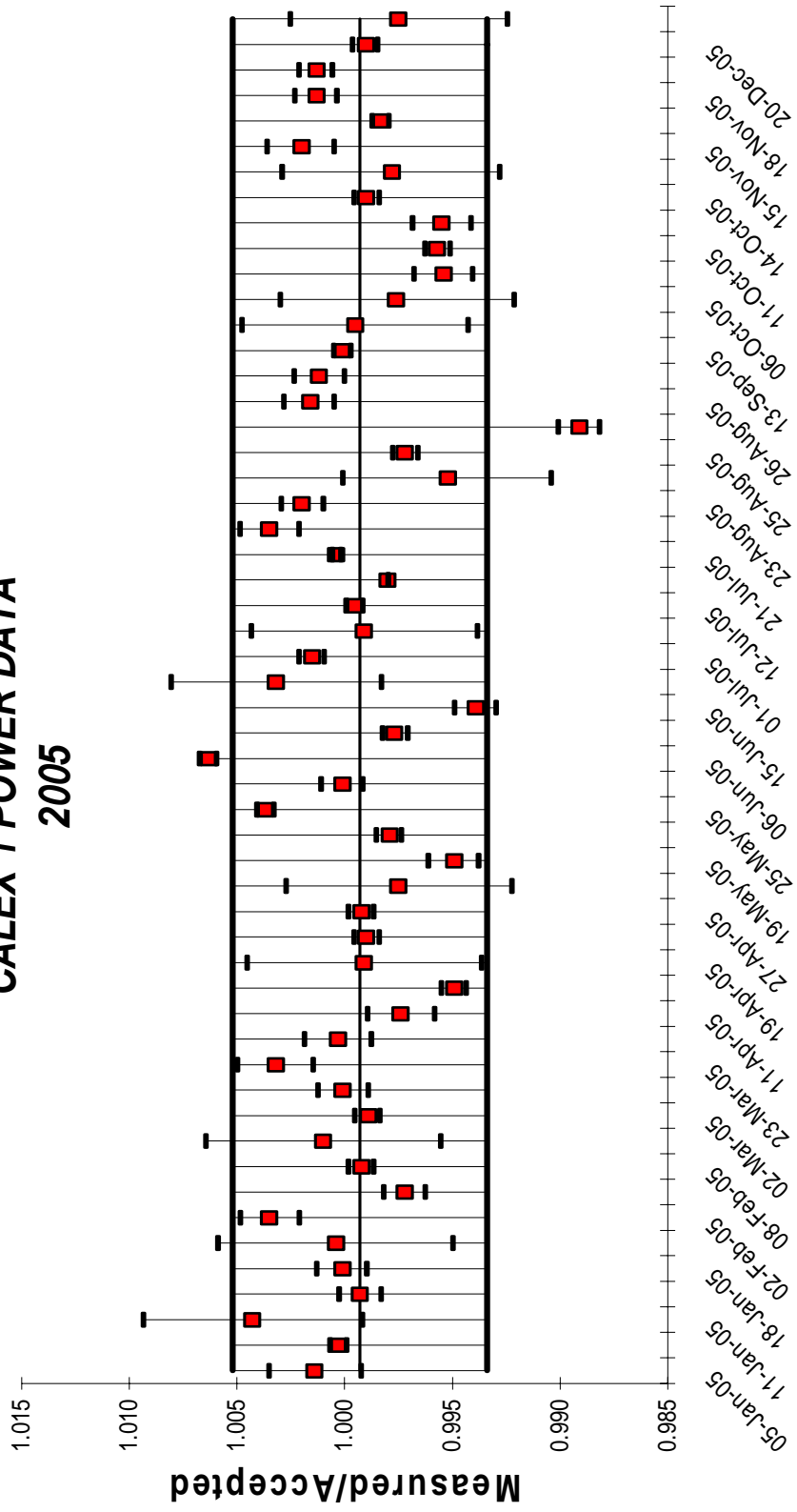
|                              |        |        |
|------------------------------|--------|--------|
| Mean error (mW)              | -0.598 | -0.550 |
| Standard deviation(mW)       | -0.051 | 0.691  |
| Uncertainty in the Mean (mW) | -0.055 | 0.105  |
| Mean Error (%)               | -0.05% | -0.05% |
| Standard Deviation (%)       | 0.00%  | 0.07%  |
| Uncertainty in the Mean (%)  | 0.00%  | 0.01%  |
| Number of Data Points        | 6      | -4     |
| Number of Outliers           | -2     | -1     |

# New Brunswick Laboratory Calorimetry Exchange Program Power, 2005





**LAWRENCE LIVERMORE  
CALEX 1 POWER DATA  
2005**





**POWER DATA**  
Calendar Year 2005

**HANFORD: Calex 1**

| #               | Date Measured    | Instr. ID | Measured Watts | Uncert. 1 STD | Accepted Watts | Ratio M/A     | W Error       | Percent Error |
|-----------------|------------------|-----------|----------------|---------------|----------------|---------------|---------------|---------------|
| 1               | 12-Jan-05        | 9         | 1.0216         | 0.21%         | 1.0270         | 0.9947        | -0.0054       | -0.53%        |
| 2               | 20-Jan-05        | 7         | 1.0218         | 0.21%         | 1.0271         | 0.9949        | -0.0053       | -0.51%        |
| 3               | 26-Jan-05        | 10        | 1.0180         | 0.21%         | 1.0271         | 0.9911        | -0.0091       | -0.89%        |
| 4               | 01-Feb-05        | 8         | 1.0189         | 0.32%         | 1.0271         | 0.9920        | -0.0082       | -0.80%        |
| 5               | 09-Feb-05        | 9         | 1.0268         | 0.32%         | 1.0272         | 0.9996        | -0.0004       | -0.04%        |
| 6               | 10-Feb-05        | 7         | 1.0262         | 0.32%         | 1.0272         | 0.9990        | -0.0010       | -0.10%        |
| 7               | 18-Feb-05        | 9         | 1.0248         | 0.32%         | 1.0272         | 0.9976        | -0.0024       | -0.24%        |
| 8               | 24-Feb-05        | 10        | 1.0262         | 0.32%         | 1.0273         | 0.9990        | -0.0011       | -0.10%        |
| 9               | 10-Mar-05        | 7         | 1.0256         | 0.22%         | 1.0273         | 0.9983        | -0.0017       | -0.17%        |
| 10              | 22-Mar-05        | 8         | 1.0210         | 0.22%         | 1.0274         | 0.9938        | -0.0064       | -0.62%        |
| 11              | 30-Mar-05        | 9         | 1.0228         | 0.22%         | 1.0274         | 0.9955        | -0.0046       | -0.45%        |
| 12              | 31-Mar-05        | 10        | 1.0255         | 0.22%         | 1.0274         | 0.9981        | -0.0019       | -0.19%        |
| 13              | 13-Apr-05        | 9         | 1.0271         | 0.56%         | 1.0275         | 0.9996        | -0.0004       | -0.04%        |
| <b>*14</b>      | <b>15-Apr-05</b> | <b>7</b>  | <b>1.0343</b>  | <b>0.56%</b>  | <b>1.0275</b>  | <b>1.0066</b> | <b>0.0068</b> | <b>0.66%</b>  |
| 15              | 21-Apr-05        | 7         | 1.0274         | 0.56%         | 1.0276         | 0.9998        | -0.0002       | -0.02%        |
| 16              | 28-Apr-05        | 9         | 1.0203         | 0.56%         | 1.0276         | 0.9929        | -0.0073       | -0.71%        |
| 17              | 14-Jun-05        | 7         | 1.0238         | 0.58%         | 1.0278         | 0.9961        | -0.0040       | -0.39%        |
| 18              | 15-Jun-05        | 10        | 1.0245         | 0.58%         | 1.0278         | 0.9968        | -0.0033       | -0.32%        |
| 19              | 28-Jun-05        | 8         | 1.0136         | 0.58%         | 1.0279         | 0.9861        | -0.0143       | -1.39%        |
| 20              | 06-Jul-05        | 7         | 1.0164         | 0.51%         | 1.0279         | 0.9888        | -0.0115       | -1.12%        |
| 21              | 07-Jul-05        | 9         | 1.0244         | 0.51%         | 1.0279         | 0.9966        | -0.0035       | -0.34%        |
| 22              | 08-Jul-05        | 10        | 1.0241         | 0.51%         | 1.0280         | 0.9962        | -0.0039       | -0.38%        |
| 23              | 19-Jul-05        | 8         | 1.0137         | 0.51%         | 1.0280         | 0.9861        | -0.0143       | -1.39%        |
| 24              | 21-Jul-05        | 7         | 1.0247         | 0.51%         | 1.0280         | 0.9968        | -0.0033       | -0.32%        |
| 25              | 11-Aug-05        | 10        | 1.0172         | 0.35%         | 1.0281         | 0.9894        | -0.0109       | -1.06%        |
| 26              | 18-Aug-05        | 9         | 1.0235         | 0.35%         | 1.0282         | 0.9955        | -0.0047       | -0.45%        |
| 27              | 19-Aug-05        | 7         | 1.0246         | 0.35%         | 1.0282         | 0.9965        | -0.0036       | -0.35%        |
| 28              | 31-Aug-05        | 8         | 1.0249         | 0.35%         | 1.0282         | 0.9968        | -0.0033       | -0.32%        |
| 29              | 08-Sep-05        | 9         | 1.0248         | 0.15%         | 1.0283         | 0.9966        | -0.0035       | -0.34%        |
| 30              | 22-Sep-05        | 7         | 1.0276         | 0.15%         | 1.0283         | 0.9993        | -0.0007       | -0.07%        |
| 31              | 27-Sep-05        | 8         | 1.0276         | 0.15%         | 1.0284         | 0.9993        | -0.0008       | -0.07%        |
| 32              | 06-Oct-05        | 9         | 1.0281         | 0.25%         | 1.0284         | 0.9997        | -0.0003       | -0.03%        |
| 33              | 13-Oct-05        | 7         | 1.0266         | 0.25%         | 1.0284         | 0.9982        | -0.0018       | -0.18%        |
| 34              | 18-Oct-05        | 8         | 1.0232         | 0.25%         | 1.0285         | 0.9949        | -0.0053       | -0.51%        |
| 35              | 09-Nov-05        | 9         | 1.0249         | 0.07%         | 1.0286         | 0.9964        | -0.0037       | -0.36%        |
| 36              | 17-Nov-05        | 7         | 1.0239         | 0.07%         | 1.0286         | 0.9954        | -0.0047       | -0.46%        |
| 37              | 07-Dec-05        | 10        | 1.0330         | 0.47%         | 1.0287         | 1.0042        | 0.0043        | 0.42%         |
| Mean:           |                  |           |                |               |                | 0.9959        | -0.0042       | -0.41%        |
| Std. Deviation: |                  |           |                |               |                | 0.0039        | 0.0040        | 0.39%         |
| Std Error:      |                  |           |                |               |                | 0.0006        | 0.0006        | 0.06%         |

\*Statistical outliers are in bold, and not included in the graphs and calculations

**CALORIMETER DATA**  
Calendar Year 2005

LLNL: Calex 1

| #               | Date Measured | Instr. ID | Measured Watts | Uncert. 1 STD | Accepted Watts | Ratio M/A | W Error | Percent Error |
|-----------------|---------------|-----------|----------------|---------------|----------------|-----------|---------|---------------|
| 1               | 05-Jan-05     | 30        | 1.0284         | 0.11%         | 1.0270         | 1.0014    | 0.0014  | 0.14%         |
| 2               | 06-Jan-05     | 32        | 1.0273         | 0.02%         | 1.0270         | 1.0003    | 0.0003  | 0.03%         |
| 3               | 11-Jan-05     | 33        | 1.0314         | 0.26%         | 1.0270         | 1.0043    | 0.0044  | 0.43%         |
| 4               | 13-Jan-05     | 18        | 1.0263         | 0.05%         | 1.0270         | 0.9993    | -0.0007 | -0.07%        |
| 5               | 18-Jan-05     | 18        | 1.0272         | 0.06%         | 1.0271         | 1.0001    | 0.0001  | 0.01%         |
| 6               | 01-Feb-05     | 33        | 1.0275         | 0.28%         | 1.0271         | 1.0004    | 0.0004  | 0.04%         |
| 7               | 02-Feb-05     | 18        | 1.0307         | 0.07%         | 1.0271         | 1.0035    | 0.0036  | 0.35%         |
| 8               | 04-Feb-05     | 30        | 1.0243         | 0.05%         | 1.0272         | 0.9972    | -0.0029 | -0.28%        |
| 9               | 08-Feb-05     | 32        | 1.0264         | 0.03%         | 1.0272         | 0.9992    | -0.0008 | -0.08%        |
| 10              | 01-Mar-05     | 33        | 1.0283         | 0.28%         | 1.0273         | 1.0010    | 0.0010  | 0.10%         |
| 11              | 02-Mar-05     | 32        | 1.0262         | 0.03%         | 1.0273         | 0.9989    | -0.0011 | -0.11%        |
| 12              | 10-Mar-05     | 30        | 1.0274         | 0.06%         | 1.0273         | 1.0001    | 0.0001  | 0.01%         |
| 13              | 23-Mar-05     | 18        | 1.0307         | 0.09%         | 1.0274         | 1.0032    | 0.0033  | 0.32%         |
| 14              | 08-Apr-05     | 18        | 1.0278         | 0.08%         | 1.0275         | 1.0003    | 0.0003  | 0.03%         |
| 15              | 11-Apr-05     | 18        | 1.0248         | 0.08%         | 1.0275         | 0.9974    | -0.0027 | -0.26%        |
| 16              | 13-Apr-05     | 30        | 1.0223         | 0.03%         | 1.0275         | 0.9949    | -0.0052 | -0.51%        |
| 17              | 19-Apr-05     | 33        | 1.0266         | 0.28%         | 1.0275         | 0.9991    | -0.0009 | -0.09%        |
| 18              | 21-Apr-05     | 32        | 1.0265         | 0.03%         | 1.0276         | 0.9990    | -0.0011 | -0.10%        |
| 19              | 27-Apr-05     | 32        | 1.0268         | 0.03%         | 1.0276         | 0.9992    | -0.0008 | -0.08%        |
| 20              | 19-May-05     | 33        | 1.0251         | 0.27%         | 1.0277         | 0.9975    | -0.0026 | -0.25%        |
| 21              | 19-May-05     | 18        | 1.0225         | 0.06%         | 1.0277         | 0.9949    | -0.0052 | -0.51%        |
| 22              | 21-May-05     | 32        | 1.0256         | 0.03%         | 1.0277         | 0.9979    | -0.0021 | -0.21%        |
| 23              | 25-May-05     | 30        | 1.0315         | 0.02%         | 1.0277         | 1.0037    | 0.0038  | 0.37%         |
| 24              | 03-Jun-05     | 18        | 1.0279         | 0.05%         | 1.0278         | 1.0001    | 0.0001  | 0.01%         |
| 25              | 06-Jun-05     | 18        | 1.0343         | 0.02%         | 1.0278         | 1.0063    | 0.0065  | 0.63%         |
| 26              | 10-Jun-05     | 32        | 1.0254         | 0.03%         | 1.0278         | 0.9977    | -0.0024 | -0.23%        |
| 27              | 15-Jun-05     | 30        | 1.0216         | 0.05%         | 1.0278         | 0.9939    | -0.0062 | -0.61%        |
| 28              | 16-Jun-05     | 33        | 1.0311         | 0.25%         | 1.0278         | 1.0032    | 0.0033  | 0.32%         |
| 29              | 01-Jul-05     | 30        | 1.0295         | 0.03%         | 1.0279         | 1.0015    | 0.0016  | 0.15%         |
| 30              | 08-Jul-05     | 33        | 1.0270         | 0.27%         | 1.0280         | 0.9991    | -0.0010 | -0.09%        |
| 31              | 12-Jul-05     | 33        | 1.0275         | 0.02%         | 1.0280         | 0.9995    | -0.0005 | -0.05%        |
| 32              | 14-Jul-05     | 30        | 1.0259         | 0.00%         | 1.0280         | 0.9980    | -0.0021 | -0.20%        |
| 33              | 21-Jul-05     | 32        | 1.0284         | 0.01%         | 1.0280         | 1.0004    | 0.0004  | 0.04%         |
| 34              | 21-Jul-05     | 18        | 1.0316         | 0.07%         | 1.0280         | 1.0035    | 0.0036  | 0.35%         |
| 35              | 23-Aug-05     | 30        | 1.0302         | 0.05%         | 1.0282         | 1.0020    | 0.0020  | 0.20%         |
| 36              | 24-Aug-05     | 33        | 1.0233         | 0.25%         | 1.0282         | 0.9952    | -0.0049 | -0.48%        |
| 37              | 25-Aug-05     | 32        | 1.0253         | 0.03%         | 1.0282         | 0.9972    | -0.0029 | -0.28%        |
| 38              | 25-Aug-05     | 18        | 1.0170         | 0.05%         | 1.0282         | 0.9891    | -0.0112 | -1.09%        |
| 39              | 26-Aug-05     | 18        | 1.0299         | 0.06%         | 1.0282         | 1.0016    | 0.0017  | 0.16%         |
| 40              | 13-Sep-05     | 18        | 1.0295         | 0.06%         | 1.0283         | 1.0012    | 0.0012  | 0.12%         |
| 41              | 13-Sep-05     | 32        | 1.0284         | 0.02%         | 1.0283         | 1.0001    | 0.0001  | 0.01%         |
| 42              | 15-Sep-05     | 33        | 1.0278         | 0.27%         | 1.0283         | 0.9995    | -0.0005 | -0.05%        |
| 43              | 06-Oct-05     | 33        | 1.0259         | 0.28%         | 1.0284         | 0.9976    | -0.0025 | -0.24%        |
| 44              | 07-Oct-05     | 30        | 1.0237         | 0.07%         | 1.0284         | 0.9954    | -0.0047 | -0.46%        |
| 45              | 11-Oct-05     | 30        | 1.0240         | 0.03%         | 1.0284         | 0.9957    | -0.0044 | -0.43%        |
| 46              | 12-Oct-05     | 18        | 1.0238         | 0.07%         | 1.0284         | 0.9955    | -0.0046 | -0.45%        |
| 47              | 14-Oct-05     | 32        | 1.0274         | 0.03%         | 1.0285         | 0.9990    | -0.0011 | -0.10%        |
| 48              | 15-Nov-05     | 33        | 1.0264         | 0.26%         | 1.0286         | 0.9978    | -0.0022 | -0.22%        |
| 49              | 15-Nov-05     | 18        | 1.0307         | 0.08%         | 1.0286         | 1.0020    | 0.0021  | 0.20%         |
| 50              | 17-Nov-05     | 32        | 1.0269         | 0.02%         | 1.0286         | 0.9983    | -0.0017 | -0.17%        |
| 51              | 18-Nov-05     | 30        | 1.0300         | 0.05%         | 1.0286         | 1.0013    | 0.0014  | 0.13%         |
| 52              | 07-Dec-05     | 18        | 1.0301         | 0.04%         | 1.0287         | 1.0013    | 0.0014  | 0.13%         |
| 53              | 20-Dec-05     | 32        | 1.03           | 0.03%         | 1.0288         | 0.9990    | -0.0010 | -0.10%        |
| 54              | 21-Dec-05     | 33        | 1.03           | 0.26%         | 1.0288         | 0.9975    | -0.0026 | -0.25%        |
| Mean:           |               |           |                |               |                | 0.9993    | -0.0007 | -0.07%        |
| Std. Deviation: |               |           |                |               |                | 0.0030    | 0.0031  | 0.30%         |
| Std Error:      |               |           |                |               |                | 0.0004    | 0.0004  | 0.04%         |

**I.  $P_{\text{eff}}$  VALUES TABLES AND GRAPHS**



**RESULTS OF ANALYSIS OF P-EFFECTIVE DATA  
1st QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|   |        |        |
|---|--------|--------|
| Mean error ( $\mu\text{W/g}$ )              | -2.648 | -4.857 |
| Standard deviation( $\mu\text{W/g}$ )       | 3.802  | 2.406  |
| Uncertainty in the Mean ( $\mu\text{W/g}$ ) | 0.694  | 0.695  |
| Mean Error (%)                              | -0.10% | -0.19% |
| Standard Deviation (%)                      | 0.15%  | 0.09%  |
| Uncertainty in the Mean (%)                 | 0.03%  | 0.03%  |
| Number of Data Points                       | 30     | 12     |
| Number of Outliers                          | 0      | 0      |

**Difference from Last Quarter in:**

|   |        |        |
|---|--------|--------|
| Mean error ( $\mu\text{W/g}$ )              | -0.417 | -0.520 |
| Standard deviation( $\mu\text{W/g}$ )       | -0.041 | 0.191  |
| Uncertainty in the Mean ( $\mu\text{W/g}$ ) | -0.059 | 0.056  |
| Mean Error (%)                              | -0.01% | -0.02% |
| Standard Deviation (%)                      | 0.30%  | 0.00%  |
| Uncertainty in the Mean (%)                 | 0.00%  | 0.01%  |
| Number of Data Points                       | 4      | 0      |
| Number of Outliers                          | 0      | 0      |

**RESULTS OF ANALYSIS OF P-EFFECTIVE DATA**  
**2nd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|   |        |        |
|---|--------|--------|
| Mean error ( $\mu\text{W/g}$ )              | -3.295 | -4.037 |
| Standard deviation( $\mu\text{W/g}$ )       | 5.067  | 2.135  |
| Uncertainty in the Mean ( $\mu\text{W/g}$ ) | 1.162  | 0.503  |
| Mean Error (%)                              | -0.13% | -0.16% |
| Standard Deviation (%)                      | 0.20%  | 0.08%  |
| Uncertainty in the Mean (%)                 | 0.05%  | 0.02%  |
| Number of Data Points                       | 19     | 18     |
| Number of Outliers                          | 0      | 0      |

**Difference from Last Quarter in:**

|   |        |        |
|---|--------|--------|
| Mean error ( $\mu\text{W/g}$ )              | -0.647 | 0.820  |
| Standard deviation( $\mu\text{W/g}$ )       | 1.265  | -0.271 |
| Uncertainty in the Mean ( $\mu\text{W/g}$ ) | 0.468  | -0.192 |
| Mean Error (%)                              | -0.03% | 0.03%  |
| Standard Deviation (%)                      | 0.05%  | -0.01% |
| Uncertainty in the Mean (%)                 | 0.02%  | -0.01% |
| Number of Data Points                       | -11    | 6      |
| Number of Outliers                          | 0      | 0      |

**RESULTS OF ANALYSIS OF P-EFFECTIVE DATA**  
**3rd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|   |        |        |
|---|--------|--------|
| Mean error ( $\mu\text{W/g}$ )              | -4.349 | -3.503 |
| Standard deviation( $\mu\text{W/g}$ )       | 5.174  | 2.556  |
| Uncertainty in the Mean ( $\mu\text{W/g}$ ) | 1.129  | 0.738  |
| Mean Error (%)                              | -0.17% | -0.14% |
| Standard Deviation (%)                      | 0.20%  | 0.10%  |
| Uncertainty in the Mean (%)                 | 0.04%  | 0.03%  |
| Number of Data Points                       | 21     | 12     |
| Number of Outliers                          | 0      | 0      |

**Difference from Last Quarter in:**

|   |        |       |
|---|--------|-------|
| Mean error ( $\mu\text{W/g}$ )              | -1.054 | 0.534 |
| Standard deviation( $\mu\text{W/g}$ )       | 0.107  | 0.421 |
| Uncertainty in the Mean ( $\mu\text{W/g}$ ) | -0.033 | 0.235 |
| Mean Error (%)                              | -0.04% | 0.02% |
| Standard Deviation (%)                      | 0.00%  | 0.02% |
| Uncertainty in the Mean (%)                 | -0.01% | 0.01% |
| Number of Data Points                       | 2      | -6    |
| Number of Outliers                          | 0      | 0     |

**RESULTS OF ANALYSIS OF P-EFFECTIVE DATA**  
**4th QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

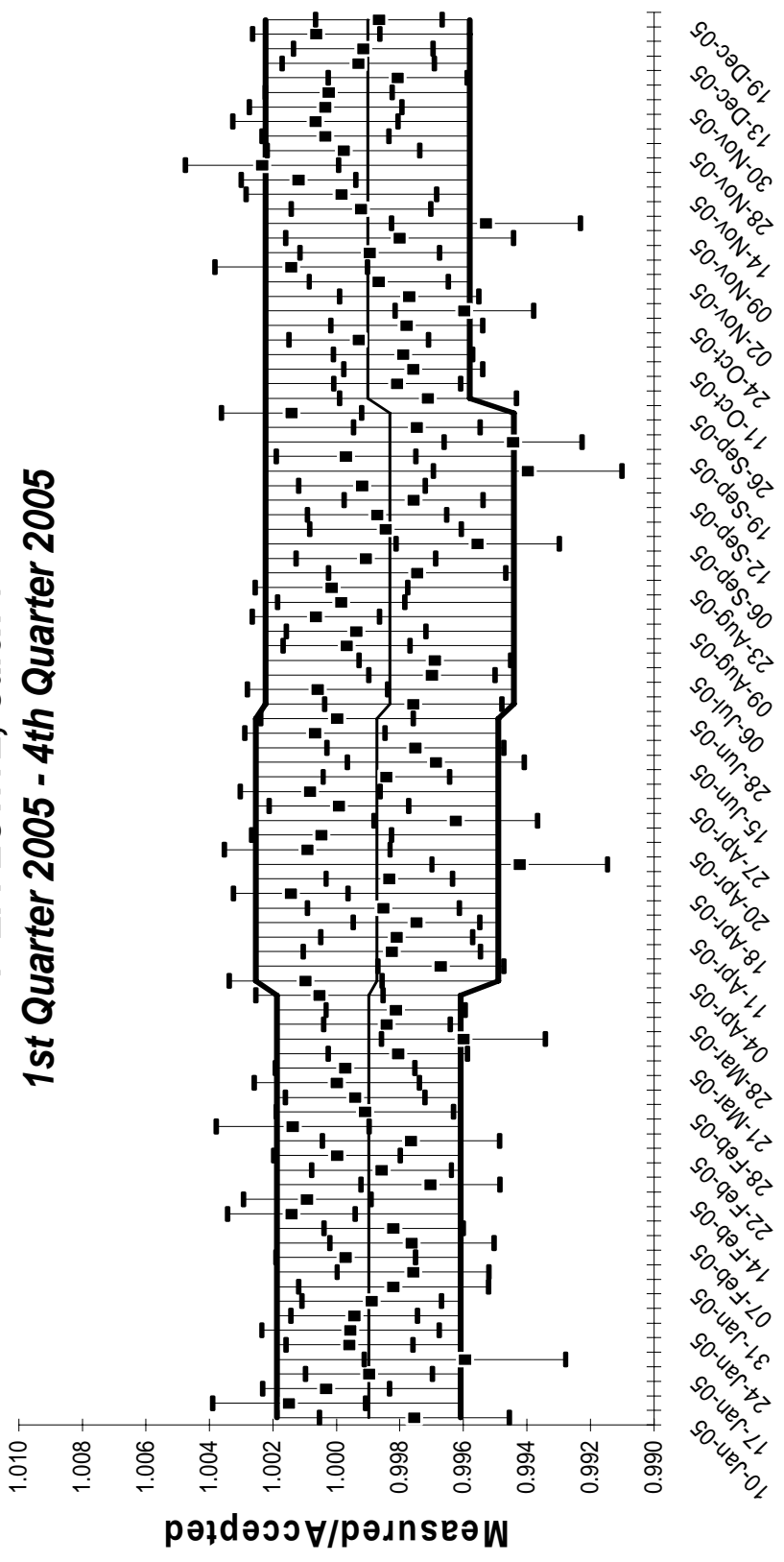
|   |        |        |
|---|--------|--------|
| Mean error ( $\mu\text{W/g}$ )              | -2.546 | -4.522 |
| Standard deviation( $\mu\text{W/g}$ )       | 4.233  | 1.520  |
| Uncertainty in the Mean ( $\mu\text{W/g}$ ) | 0.815  | 0.621  |
| Mean Error (%)                              | -0.10% | -0.17% |
| Standard Deviation (%)                      | 0.16%  | 0.06%  |
| Uncertainty in the Mean (%)                 | 0.03%  | 0.02%  |
| Number of Data Points                       | 27     | 6      |
| Number of Outliers                          | 0      | 0      |

**Difference from Last Quarter in:**

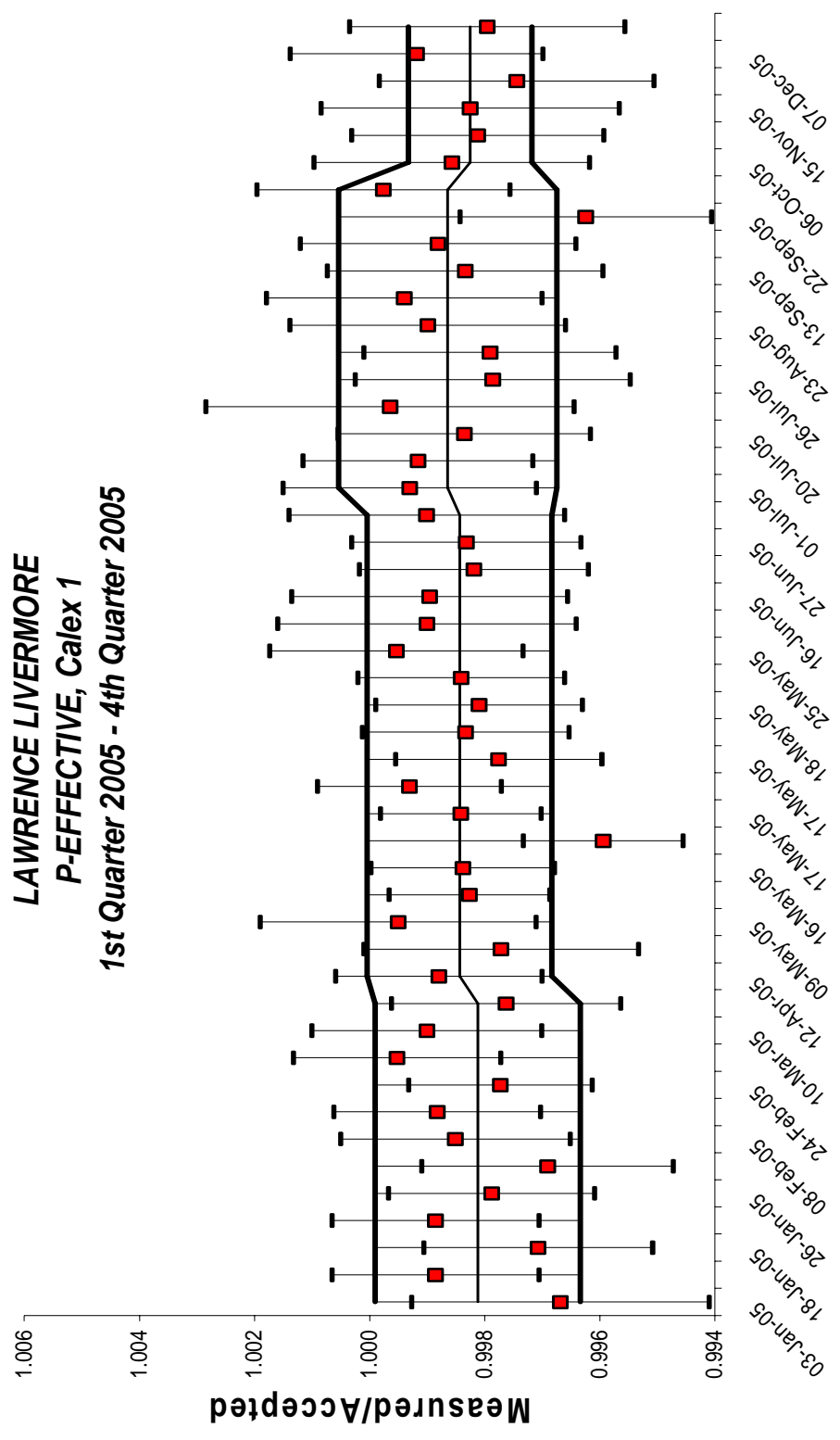
|   |        |        |
|---|--------|--------|
| Mean error ( $\mu\text{W/g}$ )              | 1.803  | -1.019 |
| Standard deviation( $\mu\text{W/g}$ )       | -0.941 | -1.036 |
| Uncertainty in the Mean ( $\mu\text{W/g}$ ) | -0.314 | -0.117 |
| Mean Error (%)                              | 0.07%  | -0.03% |
| Standard Deviation (%)                      | -0.04% | -0.04% |
| Uncertainty in the Mean (%)                 | -0.01% | -0.01% |
| Number of Data Points                       | 6      | -6     |
| Number of Outliers                          | 0      | 0      |



**HANFORD**  
**P-EFFECTIVE, Calex 1**  
**1st Quarter 2005 - 4th Quarter 2005**



**LAWRENCE LIVERMORE**  
**P-EFFECTIVE, Calex 1**  
**1st Quarter 2005 - 4th Quarter 2005**



**RESULTS OF ANALYSIS OF P-EFFECTIVE DATA  
2005**

Hanford Calex 1 LLNL Calex 1

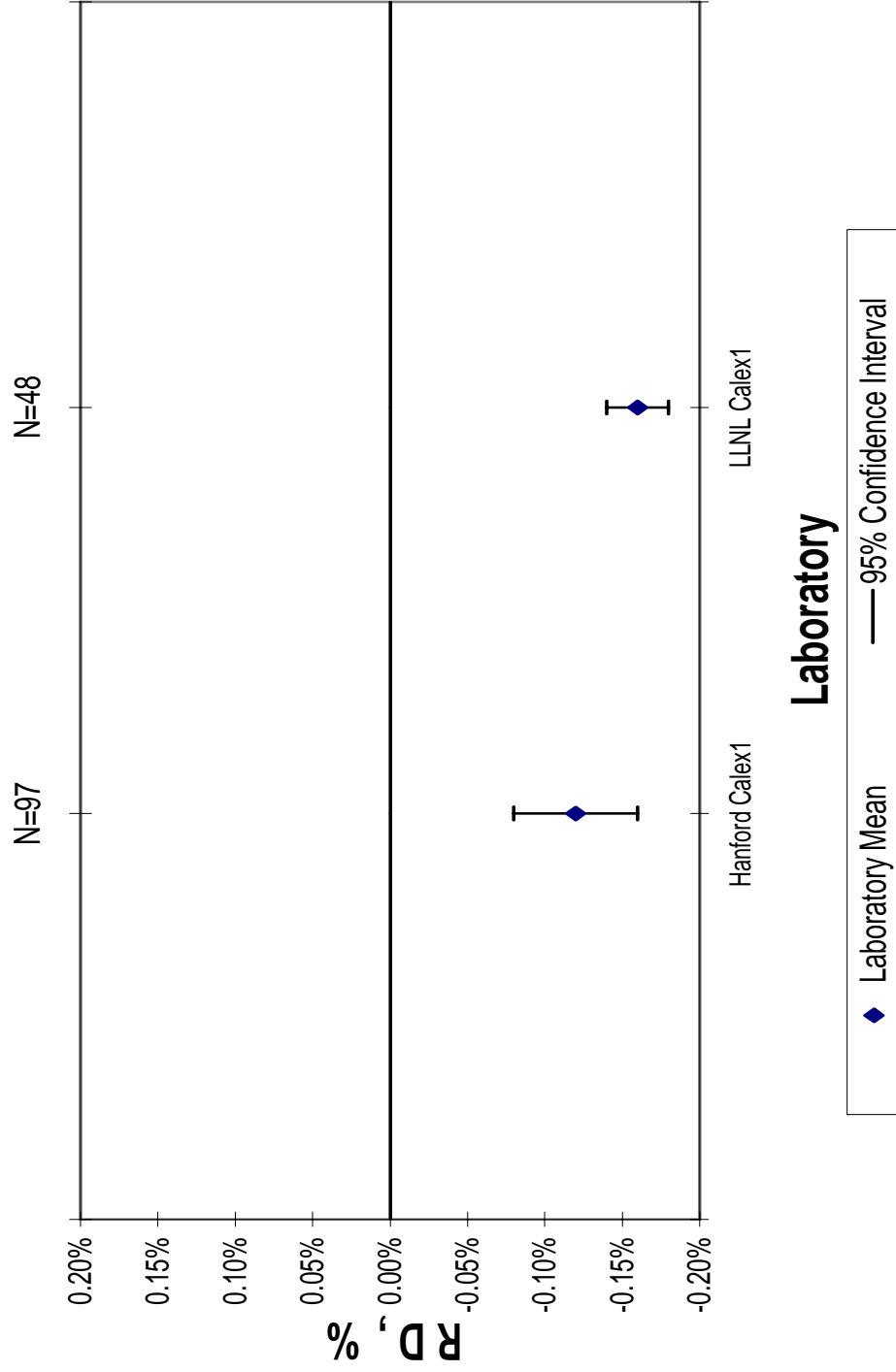
|   |        |        |
|---|--------|--------|
| Mean error ( $\mu\text{W/g}$ )              | -3.115 | -4.169 |
| Standard deviation( $\mu\text{W/g}$ )       | 4.484  | 2.244  |
| Uncertainty in the Mean ( $\mu\text{W/g}$ ) | 0.455  | 0.324  |
| Mean Error (%)                              | -0.12% | -0.16% |
| Standard Deviation (%)                      | 0.17%  | 0.09%  |
| Uncertainty in the Mean (%)                 | 0.02%  | 0.01%  |
| Number of Data Points                       | 97     | 48     |
| Number of Outliers                          | 0      | 0      |

**Difference from Last Year in:**

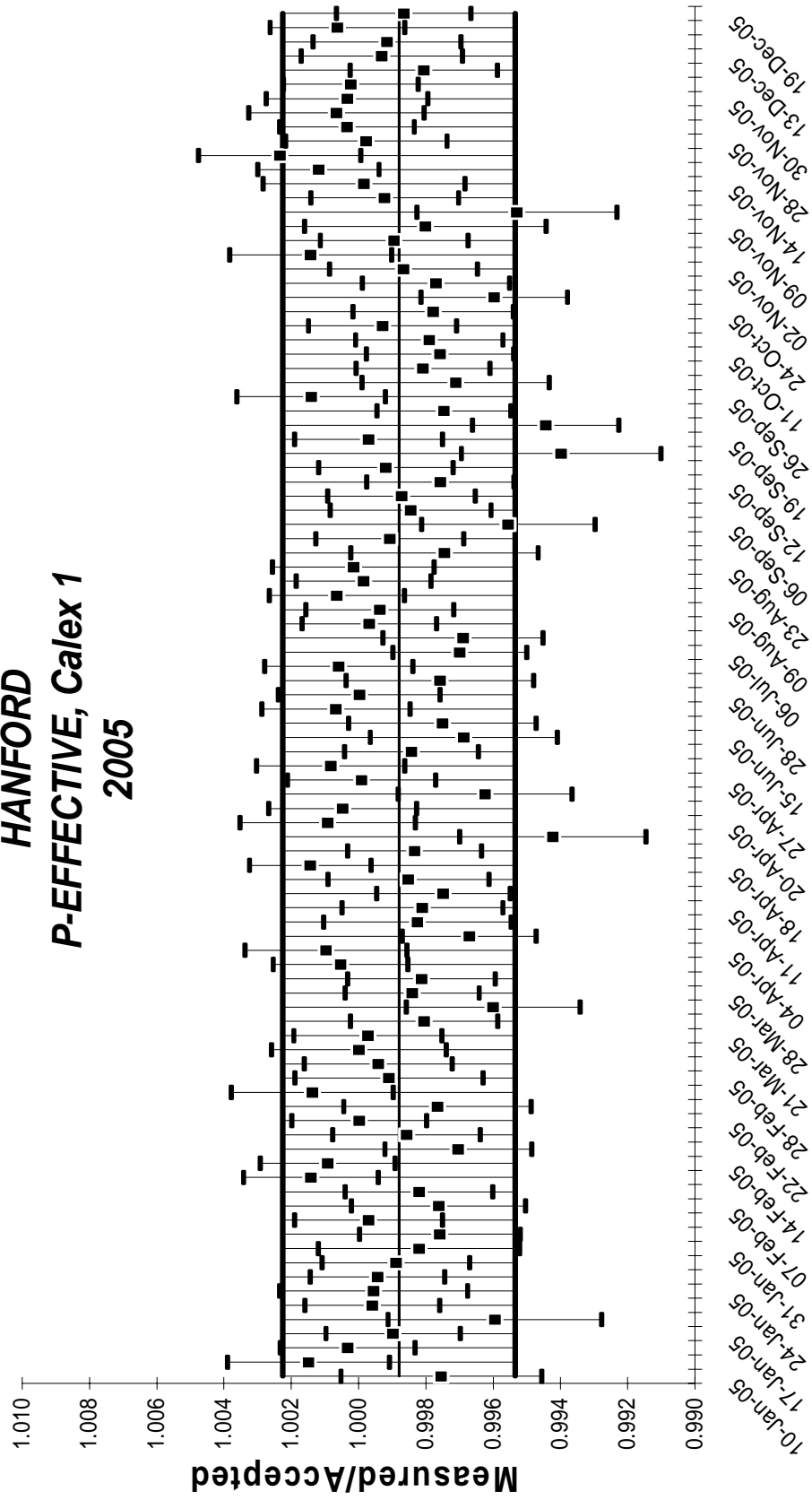
|   |        |        |
|---|--------|--------|
| Mean error ( $\mu\text{W/g}$ )              | -0.911 | 0.678  |
| Standard deviation( $\mu\text{W/g}$ )       | 0.854  | -0.142 |
| Uncertainty in the Mean ( $\mu\text{W/g}$ ) | 0.156  | 0.050  |
| Mean Error (%)                              | -0.03% | 0.03%  |
| Standard Deviation (%)                      | 0.03%  | 0.00%  |
| Uncertainty in the Mean (%)                 | 0.01%  | 0.00%  |
| Number of Data Points                       | -50    | -28    |
| Number of Outliers                          | -1     | 0      |

# New Brunswick Laboratory Calorimetry Exchange Program

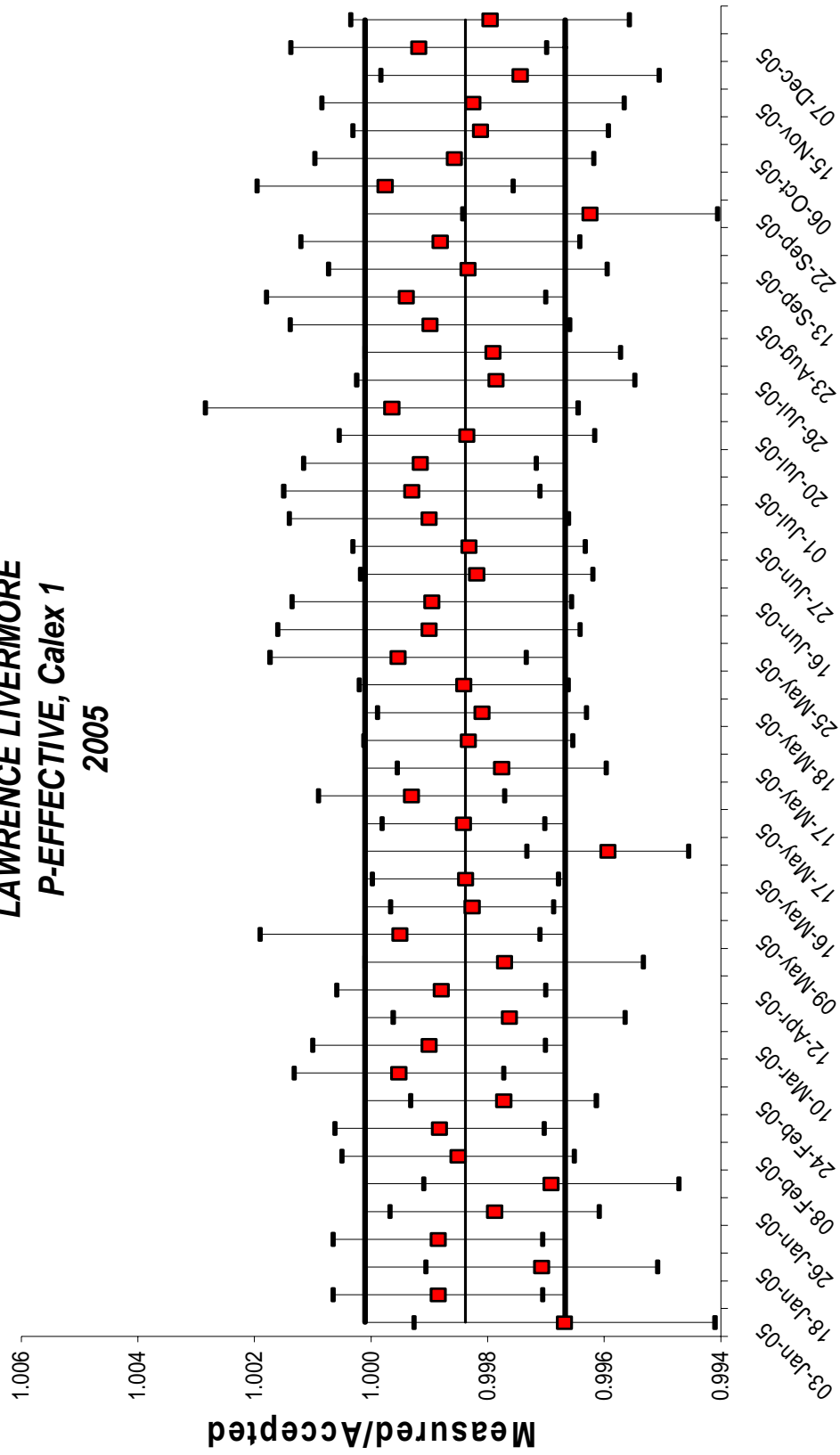
## $P_{eff}$ , 2005



**HANFORD**  
**P-EFFECTIVE, Calex 1**  
**2005**



**LAWRENCE LIVERMORE  
P-EFFECTIVE, Calex 1  
2005**



**P-EFFECTIVE DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #  | Date Measured | Instr. ID | P-eff (mw/g) | Uncert. 1 STD | Accepted P-eff | Ratio M/A | mW/g Error | Percent Error |
|----|---------------|-----------|--------------|---------------|----------------|-----------|------------|---------------|
| 1  | 10-Jan-05     | 2424      | 2.5752       | 0.15%         | 2.5816         | 0.9975    | -0.0064    | -0.25%        |
| 2  | 10-Jan-05     | 2026      | 2.5854       | 0.12%         | 2.5816         | 1.0015    | 0.0038     | 0.15%         |
| 3  | 11-Jan-05     | 2740      | 2.5824       | 0.10%         | 2.5816         | 1.0003    | 0.0008     | 0.03%         |
| 4  | 17-Jan-05     | 2740      | 2.5790       | 0.10%         | 2.5817         | 0.9990    | -0.0027    | -0.10%        |
| 5  | 18-Jan-05     | 2424      | 2.5712       | 0.16%         | 2.5817         | 0.9959    | -0.0105    | -0.41%        |
| 6  | 18-Jan-05     | 2026      | 2.5806       | 0.10%         | 2.5817         | 0.9996    | -0.0011    | -0.04%        |
| 7  | 24-Jan-05     | 2424      | 2.5806       | 0.14%         | 2.5818         | 0.9996    | -0.0012    | -0.04%        |
| 8  | 25-Jan-05     | 2026      | 2.5803       | 0.10%         | 2.5818         | 0.9994    | -0.0015    | -0.06%        |
| 9  | 26-Jan-05     | 2740      | 2.5789       | 0.11%         | 2.5818         | 0.9989    | -0.0029    | -0.11%        |
| 10 | 31-Jan-05     | 2424      | 2.5772       | 0.15%         | 2.5819         | 0.9982    | -0.0047    | -0.18%        |
| 11 | 31-Jan-05     | 2026      | 2.5756       | 0.12%         | 2.5819         | 0.9976    | -0.0063    | -0.24%        |
| 12 | 01-Feb-05     | 2740      | 2.5811       | 0.11%         | 2.5819         | 0.9997    | -0.0008    | -0.03%        |
| 13 | 07-Feb-05     | 2424      | 2.5758       | 0.13%         | 2.5820         | 0.9976    | -0.0062    | -0.24%        |
| 14 | 07-Feb-05     | 2026      | 2.5773       | 0.11%         | 2.5820         | 0.9982    | -0.0047    | -0.18%        |
| 15 | 08-Feb-05     | 2740      | 2.5856       | 0.10%         | 2.5820         | 1.0014    | 0.0036     | 0.14%         |
| 16 | 14-Feb-05     | 2740      | 2.5844       | 0.10%         | 2.5820         | 1.0009    | 0.0024     | 0.09%         |
| 17 | 16-Feb-05     | 2424      | 2.5744       | 0.11%         | 2.5821         | 0.9970    | -0.0077    | -0.30%        |
| 18 | 17-Feb-05     | 2026      | 2.5784       | 0.11%         | 2.5821         | 0.9986    | -0.0037    | -0.14%        |
| 19 | 22-Feb-05     | 2740      | 2.5821       | 0.10%         | 2.5822         | 1.0000    | -0.0001    | 0.00%         |
| 20 | 23-Feb-05     | 2424      | 2.5761       | 0.14%         | 2.5822         | 0.9976    | -0.0061    | -0.24%        |
| 21 | 23-Feb-05     | 2026      | 2.5857       | 0.12%         | 2.5822         | 1.0014    | 0.0035     | 0.14%         |
| 22 | 28-Feb-05     | 2424      | 2.5799       | 0.14%         | 2.5822         | 0.9991    | -0.0023    | -0.09%        |
| 23 | 14-Mar-05     | 2740      | 2.5809       | 0.11%         | 2.5824         | 0.9994    | -0.0015    | -0.06%        |
| 24 | 15-Mar-05     | 2424      | 2.5824       | 0.13%         | 2.5824         | 1.0000    | 0.0000     | 0.00%         |
| 25 | 21-Mar-05     | 2026      | 2.5818       | 0.11%         | 2.5825         | 0.9997    | -0.0007    | -0.03%        |
| 26 | 21-Mar-05     | 2740      | 2.5775       | 0.11%         | 2.5825         | 0.9981    | -0.0050    | -0.19%        |
| 27 | 22-Mar-05     | 2424      | 2.5722       | 0.13%         | 2.5825         | 0.9960    | -0.0103    | -0.40%        |
| 28 | 28-Mar-05     | 2026      | 2.5785       | 0.10%         | 2.5826         | 0.9984    | -0.0041    | -0.16%        |
| 29 | 29-Mar-05     | 2424      | 2.5778       | 0.11%         | 2.5826         | 0.9981    | -0.0048    | -0.19%        |
| 30 | 29-Mar-05     | 2740      | 2.5840       | 0.10%         | 2.5826         | 1.0005    | 0.0014     | 0.05%         |
| 31 | 04-Apr-05     | 2026      | 2.5852       | 0.12%         | 2.5827         | 1.0010    | 0.0025     | 0.10%         |
| 32 | 04-Apr-05     | 2740      | 2.5742       | 0.10%         | 2.5827         | 0.9967    | -0.0085    | -0.33%        |
| 33 | 05-Apr-05     | 2424      | 2.5782       | 0.14%         | 2.5827         | 0.9982    | -0.0045    | -0.18%        |
| 34 | 11-Apr-05     | 2026      | 2.5779       | 0.12%         | 2.5828         | 0.9981    | -0.0049    | -0.19%        |
| 35 | 12-Apr-05     | 2740      | 2.5763       | 0.10%         | 2.5828         | 0.9975    | -0.0065    | -0.25%        |
| 36 | 13-Apr-05     | 2424      | 2.5790       | 0.12%         | 2.5828         | 0.9985    | -0.0038    | -0.15%        |
| 37 | 18-Apr-05     | 2740      | 2.5866       | 0.09%         | 2.5829         | 1.0014    | 0.0037     | 0.14%         |
| 38 | 19-Apr-05     | 2026      | 2.5786       | 0.10%         | 2.5829         | 0.9983    | -0.0043    | -0.17%        |
| 39 | 19-Apr-05     | 2424      | 2.5680       | 0.14%         | 2.5829         | 0.9942    | -0.0149    | -0.58%        |
| 40 | 20-Apr-05     | 2424      | 2.5853       | 0.13%         | 2.5829         | 1.0009    | 0.0024     | 0.09%         |
| 41 | 25-Apr-05     | 2740      | 2.5842       | 0.11%         | 2.5830         | 1.0005    | 0.0012     | 0.05%         |
| 42 | 26-Apr-05     | 2424      | 2.5733       | 0.13%         | 2.5830         | 0.9962    | -0.0097    | -0.38%        |
| 43 | 27-Apr-05     | 2026      | 2.5828       | 0.11%         | 2.5830         | 0.9999    | -0.0002    | -0.01%        |
| 44 | 13-Jun-05     | 2026      | 2.5858       | 0.11%         | 2.5837         | 1.0008    | 0.0021     | 0.08%         |
| 45 | 14-Jun-05     | 2740      | 2.5796       | 0.10%         | 2.5837         | 0.9984    | -0.0041    | -0.16%        |
| 46 | 15-Jun-05     | 2424      | 2.5756       | 0.14%         | 2.5837         | 0.9969    | -0.0081    | -0.31%        |
| 47 | 27-Jun-05     | 2424      | 2.5774       | 0.14%         | 2.5839         | 0.9975    | -0.0065    | -0.25%        |
| 48 | 28-Jun-05     | 2026      | 2.5856       | 0.11%         | 2.5839         | 1.0007    | 0.0017     | 0.07%         |
| 49 | 28-Jun-05     | 2740      | 2.5838       | 0.12%         | 2.5839         | 1.0000    | -0.0001    | 0.00%         |
| 50 | 05-Jul-05     | 2424      | 2.5777       | 0.14%         | 2.5840         | 0.9976    | -0.0063    | -0.24%        |

**P-EFFECTIVE DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #                   | Date Measured | Instr. ID | P-eff (mw/g) | Uncert. 1 STD | Accepted P-eff | Ratio M/A | mW/g Error | Percent Error |
|---------------------|---------------|-----------|--------------|---------------|----------------|-----------|------------|---------------|
| 51                  | 06-Jul-05     | 2026      | 2.5855       | 0.11%         | 2.5840         | 1.0006    | 0.0015     | 0.06%         |
| 52                  | 06-Jul-05     | 2740      | 2.5762       | 0.10%         | 2.5840         | 0.9970    | -0.0078    | -0.30%        |
| 53                  | 25-Jul-05     | 2424      | 2.5762       | 0.12%         | 2.5842         | 0.9969    | -0.0080    | -0.31%        |
| 54                  | 26-Jul-05     | 2026      | 2.5834       | 0.10%         | 2.5842         | 0.9997    | -0.0008    | -0.03%        |
| 55                  | 09-Aug-05     | 2026      | 2.5828       | 0.11%         | 2.5844         | 0.9994    | -0.0016    | -0.06%        |
| 56                  | 10-Aug-05     | 2740      | 2.5861       | 0.10%         | 2.5845         | 1.0006    | 0.0017     | 0.06%         |
| 57                  | 22-Aug-05     | 2740      | 2.5842       | 0.10%         | 2.5846         | 0.9998    | -0.0004    | -0.02%        |
| 58                  | 23-Aug-05     | 2026      | 2.5850       | 0.12%         | 2.5846         | 1.0001    | 0.0004     | 0.01%         |
| 59                  | 29-Aug-05     | 2424      | 2.5781       | 0.14%         | 2.5847         | 0.9974    | -0.0066    | -0.26%        |
| 60                  | 30-Aug-05     | 2026      | 2.5823       | 0.11%         | 2.5847         | 0.9991    | -0.0024    | -0.09%        |
| 61                  | 06-Sep-05     | 2424      | 2.5733       | 0.13%         | 2.5848         | 0.9955    | -0.0115    | -0.45%        |
| 62                  | 06-Sep-05     | 2026      | 2.5808       | 0.12%         | 2.5848         | 0.9984    | -0.0040    | -0.16%        |
| 63                  | 07-Sep-05     | 2740      | 2.5815       | 0.11%         | 2.5848         | 0.9987    | -0.0033    | -0.13%        |
| 64                  | 12-Sep-05     | 2740      | 2.5786       | 0.11%         | 2.5849         | 0.9976    | -0.0063    | -0.24%        |
| 65                  | 13-Sep-05     | 2026      | 2.5828       | 0.10%         | 2.5849         | 0.9992    | -0.0021    | -0.08%        |
| 66                  | 19-Sep-05     | 2424      | 2.5694       | 0.15%         | 2.5850         | 0.9940    | -0.0156    | -0.60%        |
| 67                  | 19-Sep-05     | 2026      | 2.5842       | 0.11%         | 2.5850         | 0.9997    | -0.0008    | -0.03%        |
| 68                  | 20-Sep-05     | 2740      | 2.5706       | 0.11%         | 2.5850         | 0.9944    | -0.0144    | -0.56%        |
| 69                  | 26-Sep-05     | 2740      | 2.5785       | 0.10%         | 2.5851         | 0.9975    | -0.0066    | -0.25%        |
| 70                  | 26-Sep-05     | 2026      | 2.5887       | 0.11%         | 2.5851         | 1.0014    | 0.0036     | 0.14%         |
| 71                  | 03-Oct-05     | 2424      | 2.5777       | 0.14%         | 2.5852         | 0.9971    | -0.0075    | -0.29%        |
| 72                  | 10-Oct-05     | 2740      | 2.5803       | 0.10%         | 2.5853         | 0.9981    | -0.0050    | -0.19%        |
| 73                  | 11-Oct-05     | 2026      | 2.5790       | 0.11%         | 2.5853         | 0.9976    | -0.0063    | -0.24%        |
| 74                  | 17-Oct-05     | 2026      | 2.5799       | 0.11%         | 2.5854         | 0.9979    | -0.0055    | -0.21%        |
| 75                  | 17-Oct-05     | 2740      | 2.5835       | 0.11%         | 2.5854         | 0.9993    | -0.0019    | -0.07%        |
| 76                  | 24-Oct-05     | 2740      | 2.5797       | 0.12%         | 2.5854         | 0.9978    | -0.0057    | -0.22%        |
| 77                  | 31-Oct-05     | 2740      | 2.5751       | 0.11%         | 2.5855         | 0.9960    | -0.0104    | -0.40%        |
| 78                  | 01-Nov-05     | 2026      | 2.5796       | 0.11%         | 2.5856         | 0.9977    | -0.0060    | -0.23%        |
| 79                  | 02-Nov-05     | 2740      | 2.5821       | 0.11%         | 2.5856         | 0.9987    | -0.0035    | -0.13%        |
| 80                  | 07-Nov-05     | 2026      | 2.5893       | 0.12%         | 2.5856         | 1.0014    | 0.0037     | 0.14%         |
| 81                  | 08-Nov-05     | 2740      | 2.5829       | 0.11%         | 2.5856         | 0.9989    | -0.0027    | -0.11%        |
| 82                  | 09-Nov-05     | 2347      | 2.5805       | 0.18%         | 2.5857         | 0.9980    | -0.0052    | -0.20%        |
| 83                  | 11-Nov-05     | 2347      | 2.5735       | 0.15%         | 2.5857         | 0.9953    | -0.0122    | -0.47%        |
| 84                  | 14-Nov-05     | 2026      | 2.5837       | 0.11%         | 2.5857         | 0.9992    | -0.0020    | -0.08%        |
| 85                  | 14-Nov-05     | 2347      | 2.5853       | 0.15%         | 2.5857         | 0.9998    | -0.0004    | -0.02%        |
| 86                  | 15-Nov-05     | 2740      | 2.5888       | 0.09%         | 2.5857         | 1.0012    | 0.0031     | 0.12%         |
| 87                  | 17-Nov-05     | 2347      | 2.5918       | 0.12%         | 2.5858         | 1.0023    | 0.0060     | 0.23%         |
| 88                  | 28-Nov-05     | 2026      | 2.5853       | 0.12%         | 2.5859         | 0.9998    | -0.0006    | -0.02%        |
| 89                  | 29-Nov-05     | 2740      | 2.5868       | 0.10%         | 2.5859         | 1.0003    | 0.0009     | 0.03%         |
| 90                  | 29-Nov-05     | 2347      | 2.5876       | 0.13%         | 2.5859         | 1.0006    | 0.0017     | 0.06%         |
| 91                  | 30-Nov-05     | 2347      | 2.5868       | 0.12%         | 2.5859         | 1.0003    | 0.0009     | 0.03%         |
| 92                  | 05-Dec-05     | 2026      | 2.5866       | 0.10%         | 2.5860         | 1.0002    | 0.0006     | 0.02%         |
| 93                  | 06-Dec-05     | 2740      | 2.5810       | 0.11%         | 2.5860         | 0.9981    | -0.0050    | -0.19%        |
| 94                  | 13-Dec-05     | 2026      | 2.5843       | 0.12%         | 2.5861         | 0.9993    | -0.0018    | -0.07%        |
| 95                  | 13-Dec-05     | 2740      | 2.5839       | 0.11%         | 2.5861         | 0.9991    | -0.0022    | -0.09%        |
| 96                  | 19-Dec-05     | 2026      | 2.5878       | 0.10%         | 2.5862         | 1.0006    | 0.0016     | 0.06%         |
| 97                  | 19-Dec-05     | 2740      | 2.5827       | 0.10%         | 2.5862         | 0.9987    | -0.0035    | -0.13%        |
| Mean:               |               |           |              |               |                | 0.9988    | -0.0031    | -0.12%        |
| Standard Deviation: |               |           |              |               |                | 0.0017    | 0.0045     | 0.17%         |
| Standard Error:     |               |           |              |               |                | 0.0002    | 0.0005     | 0.02%         |



**P-EFFECTIVE DATA**  
**Calendar Year 2005**

**LLNL: Calex 1**

| #                   | Date Measured | Instr. ID | P-eff (mw/g) | Uncert. 1 STD | Accepted P-eff | Ratio M/A | mW/g Error | Percent Error |
|---------------------|---------------|-----------|--------------|---------------|----------------|-----------|------------|---------------|
| 1                   | 03-Jan-05     | 3         | 2.5729       | 0.13%         | 2.5815         | 0.9967    | -0.0086    | -0.33%        |
| 2                   | 11-Jan-05     | 2         | 2.5786       | 0.09%         | 2.5816         | 0.9988    | -0.0030    | -0.12%        |
| 3                   | 18-Jan-05     | 3         | 2.5741       | 0.10%         | 2.5817         | 0.9971    | -0.0076    | -0.29%        |
| 4                   | 25-Jan-05     | 1         | 2.5788       | 0.09%         | 2.5818         | 0.9988    | -0.0030    | -0.12%        |
| 5                   | 26-Jan-05     | 2         | 2.5763       | 0.09%         | 2.5818         | 0.9979    | -0.0055    | -0.21%        |
| 6                   | 27-Jan-05     | 3         | 2.5738       | 0.11%         | 2.5818         | 0.9969    | -0.0080    | -0.31%        |
| 7                   | 08-Feb-05     | 2         | 2.5781       | 0.10%         | 2.5820         | 0.9985    | -0.0039    | -0.15%        |
| 8                   | 14-Feb-05     | 1         | 2.5790       | 0.09%         | 2.5820         | 0.9988    | -0.0030    | -0.12%        |
| 9                   | 24-Feb-05     | 3         | 2.5763       | 0.08%         | 2.5822         | 0.9977    | -0.0059    | -0.23%        |
| 10                  | 28-Feb-05     | 1         | 2.5810       | 0.09%         | 2.5822         | 0.9995    | -0.0012    | -0.05%        |
| 11                  | 10-Mar-05     | 2         | 2.5798       | 0.10%         | 2.5824         | 0.9990    | -0.0026    | -0.10%        |
| 12                  | 21-Mar-05     | 3         | 2.5764       | 0.10%         | 2.5825         | 0.9976    | -0.0061    | -0.24%        |
| 13                  | 12-Apr-05     | 1         | 2.5797       | 0.09%         | 2.5828         | 0.9988    | -0.0031    | -0.12%        |
| 14                  | 18-Apr-05     | 3         | 2.5770       | 0.12%         | 2.5829         | 0.9977    | -0.0059    | -0.23%        |
| 15                  | 09-May-05     | 3         | 2.5819       | 0.12%         | 2.5832         | 0.9995    | -0.0013    | -0.05%        |
| 16                  | 16-May-05     | 1         | 2.5788       | 0.07%         | 2.5833         | 0.9983    | -0.0045    | -0.17%        |
| 17                  | 16-May-05     | 1         | 2.5791       | 0.08%         | 2.5833         | 0.9984    | -0.0042    | -0.16%        |
| 18                  | 17-May-05     | 1         | 2.5728       | 0.07%         | 2.5833         | 0.9959    | -0.0105    | -0.41%        |
| 19                  | 17-May-05     | 1         | 2.5792       | 0.07%         | 2.5833         | 0.9984    | -0.0041    | -0.16%        |
| 20                  | 17-May-05     | 1         | 2.5815       | 0.08%         | 2.5833         | 0.9993    | -0.0018    | -0.07%        |
| 21                  | 17-May-05     | 1         | 2.5775       | 0.09%         | 2.5833         | 0.9978    | -0.0058    | -0.22%        |
| 22                  | 18-May-05     | 1         | 2.5790       | 0.09%         | 2.5833         | 0.9983    | -0.0043    | -0.17%        |
| 23                  | 18-May-05     | 1         | 2.5784       | 0.09%         | 2.5833         | 0.9981    | -0.0049    | -0.19%        |
| 24                  | 18-May-05     | 1         | 2.5792       | 0.09%         | 2.5833         | 0.9984    | -0.0041    | -0.16%        |
| 25                  | 25-May-05     | 3         | 2.5822       | 0.11%         | 2.5834         | 0.9995    | -0.0012    | -0.05%        |
| 26                  | 07-Jun-05     | 3         | 2.5810       | 0.13%         | 2.5836         | 0.9990    | -0.0026    | -0.10%        |
| 27                  | 16-Jun-05     | 1         | 2.5810       | 0.12%         | 2.5837         | 0.9990    | -0.0027    | -0.10%        |
| 28                  | 22-Jun-05     | 3         | 2.5791       | 0.10%         | 2.5838         | 0.9982    | -0.0047    | -0.18%        |
| 29                  | 27-Jun-05     | 3         | 2.5795       | 0.10%         | 2.5839         | 0.9983    | -0.0044    | -0.17%        |
| 30                  | 28-Jun-05     | 1         | 2.5813       | 0.12%         | 2.5839         | 0.9990    | -0.0026    | -0.10%        |
| 31                  | 01-Jul-05     | 1         | 2.5821       | 0.11%         | 2.5839         | 0.9993    | -0.0018    | -0.07%        |
| 32                  | 14-Jul-05     | 1         | 2.5819       | 0.10%         | 2.5841         | 0.9992    | -0.0022    | -0.08%        |
| 33                  | 20-Jul-05     | 3         | 2.5799       | 0.11%         | 2.5842         | 0.9984    | -0.0043    | -0.16%        |
| 34                  | 25-Jul-05     | 1         | 2.5833       | 0.16%         | 2.5842         | 0.9996    | -0.0009    | -0.04%        |
| 35                  | 26-Jul-05     | 3         | 2.5787       | 0.12%         | 2.5842         | 0.9979    | -0.0055    | -0.21%        |
| 36                  | 15-Aug-05     | 3         | 2.5791       | 0.11%         | 2.5845         | 0.9979    | -0.0054    | -0.21%        |
| 37                  | 23-Aug-05     | 1         | 2.5820       | 0.12%         | 2.5846         | 0.9990    | -0.0026    | -0.10%        |
| 38                  | 26-Aug-05     | 1         | 2.5831       | 0.12%         | 2.5847         | 0.9994    | -0.0016    | -0.06%        |
| 39                  | 13-Sep-05     | 1         | 2.5806       | 0.12%         | 2.5849         | 0.9983    | -0.0043    | -0.17%        |
| 40                  | 19-Sep-05     | 3         | 2.5819       | 0.12%         | 2.5850         | 0.9988    | -0.0031    | -0.12%        |
| 41                  | 22-Sep-05     | 2         | 2.5753       | 0.11%         | 2.5850         | 0.9962    | -0.0097    | -0.38%        |
| 42                  | 23-Sep-05     | 2         | 2.5844       | 0.11%         | 2.5850         | 0.9998    | -0.0006    | -0.02%        |
| 43                  | 06-Oct-05     | 3         | 2.5815       | 0.12%         | 2.5852         | 0.9986    | -0.0037    | -0.14%        |
| 44                  | 11-Oct-05     | 3         | 2.5804       | 0.11%         | 2.5853         | 0.9981    | -0.0049    | -0.19%        |
| 45                  | 15-Nov-05     | 1         | 2.5812       | 0.13%         | 2.5857         | 0.9982    | -0.0045    | -0.18%        |
| 46                  | 29-Nov-05     | 2         | 2.5793       | 0.12%         | 2.5859         | 0.9974    | -0.0066    | -0.26%        |
| 47                  | 07-Dec-05     | 2         | 2.5839       | 0.11%         | 2.5860         | 0.9992    | -0.0021    | -0.08%        |
| 48                  | 20-Dec-05     | 2         | 2.5809       | 0.12%         | 2.5862         | 0.9980    | -0.0053    | -0.20%        |
| Mean:               |               |           |              |               |                | 0.9984    | -0.0042    | -0.16%        |
| Standard Deviation: |               |           |              |               |                | 0.0009    | 0.0022     | 0.09%         |
| Standard Error:     |               |           |              |               |                | 0.0001    | 0.0003     | 0.01%         |



**J. <sup>238</sup>Pu ISOTOPE ABUNDANCE TABLES AND GRAPHS**



**RESULTS OF ANALYSIS OF Pu-238 DATA**  
**1st QUARTER 2005**

|                                  | Hanford Calex 1 | LLNL Calex 1 |
|----------------------------------|-----------------|--------------|
| Mean error (weight %)            | -0.0004%        | -0.0003%     |
| Standard deviation (weight %)    | 0.0005%         | 0.0002%      |
| certainty in the Mean (weight %) | 0.0001%         | 0.0001%      |
| Mean Error (%)                   | -4.51%          | -3.44%       |
| Standard Deviation (%)           | 5.44%           | 2.93%        |
| Uncertainty in the Mean (%)      | 0.99%           | 0.85%        |
| Number of Data Points            | 30              | 12           |
| Number of Outliers               | 0               | 0            |

**Difference from Last Quarter in:**

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | -0.0002% | -0.0002% |
| Standard deviation (weight %)    | 0.0001%  | 0.0002%  |
| certainty in the Mean (weight %) | 0.0000%  | 0.0001%  |
| Mean Error (%)                   | -1.53%   | -1.68%   |
| Standard Deviation (%)           | 0.23%    | 0.97%    |
| Uncertainty in the Mean (%)      | -0.03%   | 0.29%    |
| Number of Data Points            | 4        | 0        |
| Number of Outliers               | 0        | 0        |

**RESULTS OF ANALYSIS OF Pu-238 DATA  
2nd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | -0.0005% | -0.0001% |
| Standard deviation (weight %)    | 0.0005%  | 0.0003%  |
| certainty in the Mean (weight %) | 0.0001%  | 0.0001%  |
| Mean Error (%)                   | -6.27%   | -1.31%   |
| Standard Deviation (%)           | 6.15%    | 3.16%    |
| Uncertainty in the Mean (%)      | 1.41%    | 0.74%    |
| Number of Data Points            | 19       | 18       |
| Number of Outliers               | 0        | 0        |

**Difference from Last Quarter in:**

|                                  |          |         |
|----------------------------------|----------|---------|
| Mean error (weight %)            | -0.0001% | 0.0002% |
| Standard deviation (weight %)    | 0.0000%  | 0.0001% |
| certainty in the Mean (weight %) | 0.0000%  | 0.0000% |
| Mean Error (%)                   | -1.76%   | 2.13%   |
| Standard Deviation (%)           | 0.71%    | 0.23%   |
| Uncertainty in the Mean (%)      | 0.42%    | -0.11%  |
| Number of Data Points            | -11      | 6       |
| Number of Outliers               | 0        | 0       |

**RESULTS OF ANALYSIS OF Pu-238 DATA  
3rd QUARTER 2005**

|                                  | Hanford Calex 1 | LLNL Calex 1 |
|----------------------------------|-----------------|--------------|
| Mean error (weight %)            | -0.0004%        | -0.0002%     |
| Standard deviation (weight %)    | 0.0005%         | 0.0003%      |
| certainty in the Mean (weight %) | 0.0001%         | 0.0001%      |
| Mean Error (%)                   | -5.15%          | -2.25%       |
| Standard Deviation (%)           | 6.53%           | 4.07%        |
| Uncertainty in the Mean (%)      | 1.43%           | 1.18%        |
| Number of Data Points            | 21              | 12           |
| Number of Outliers               | 0               | 0            |

**Difference from Last Quarter in:**

|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0001% | -0.0001% |
| Standard deviation (weight %)    | 0.0000% | 0.0000%  |
| certainty in the Mean (weight %) | 0.0000% | 0.0000%  |
| Mean Error (%)                   | 1.12%   | -0.94%   |
| Standard Deviation (%)           | 0.38%   | 0.91%    |
| Uncertainty in the Mean (%)      | 0.02%   | 0.44%    |
| Number of Data Points            | 2       | -6       |
| Number of Outliers               | 0       | 0        |

**RESULTS OF ANALYSIS OF Pu-238 DATA  
4th QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

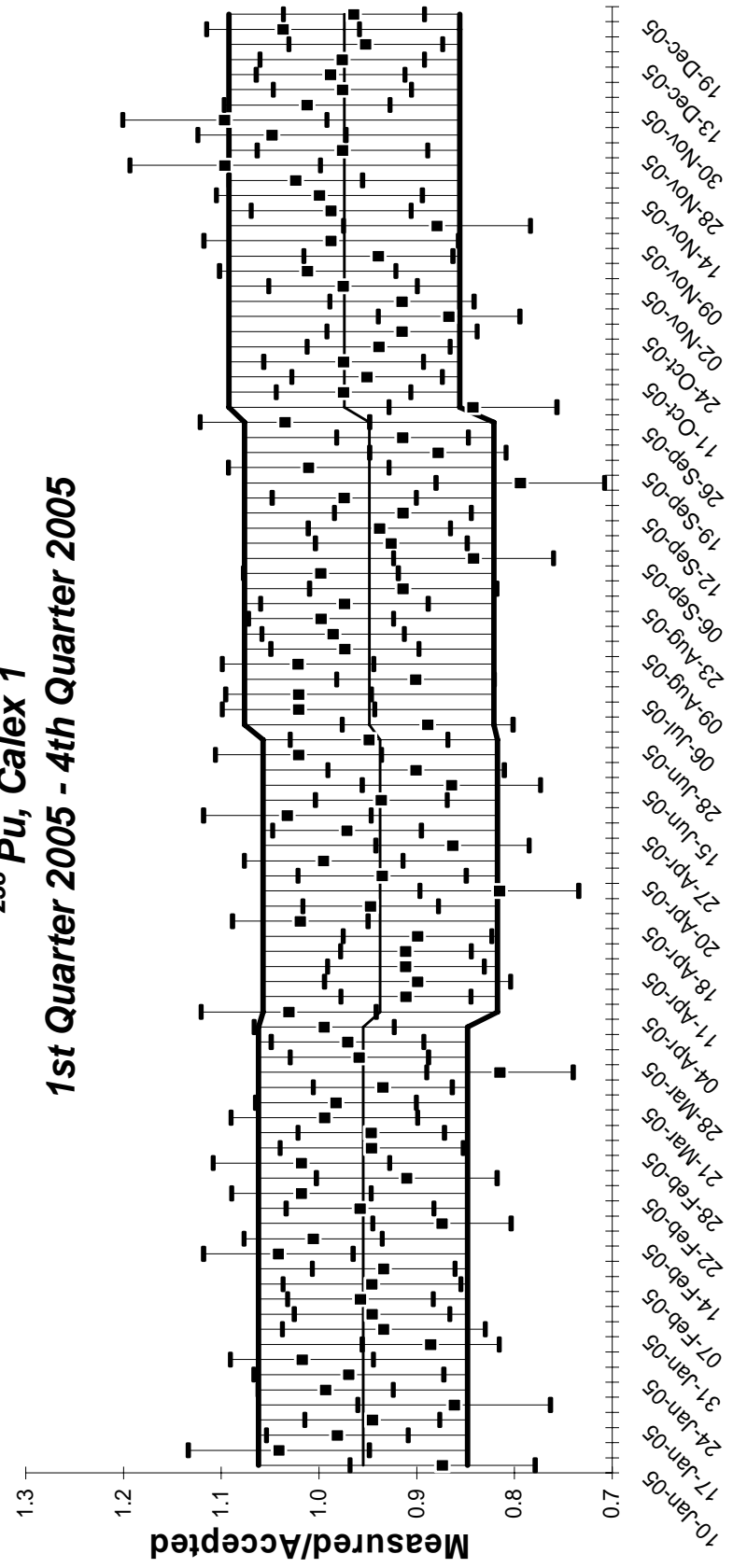
|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | -0.0002% | -0.0003% |
| Standard deviation (weight %)    | 0.0005%  | 0.0003%  |
| certainty in the Mean (weight %) | 0.0001%  | 0.0001%  |
| Mean Error (%)                   | -2.60%   | -3.54%   |
| Standard Deviation (%)           | 6.02%    | 3.83%    |
| Uncertainty in the Mean (%)      | 1.16%    | 1.56%    |
| Number of Data Points            | 27       | 6        |
| Number of Outliers               | 0        | 0        |

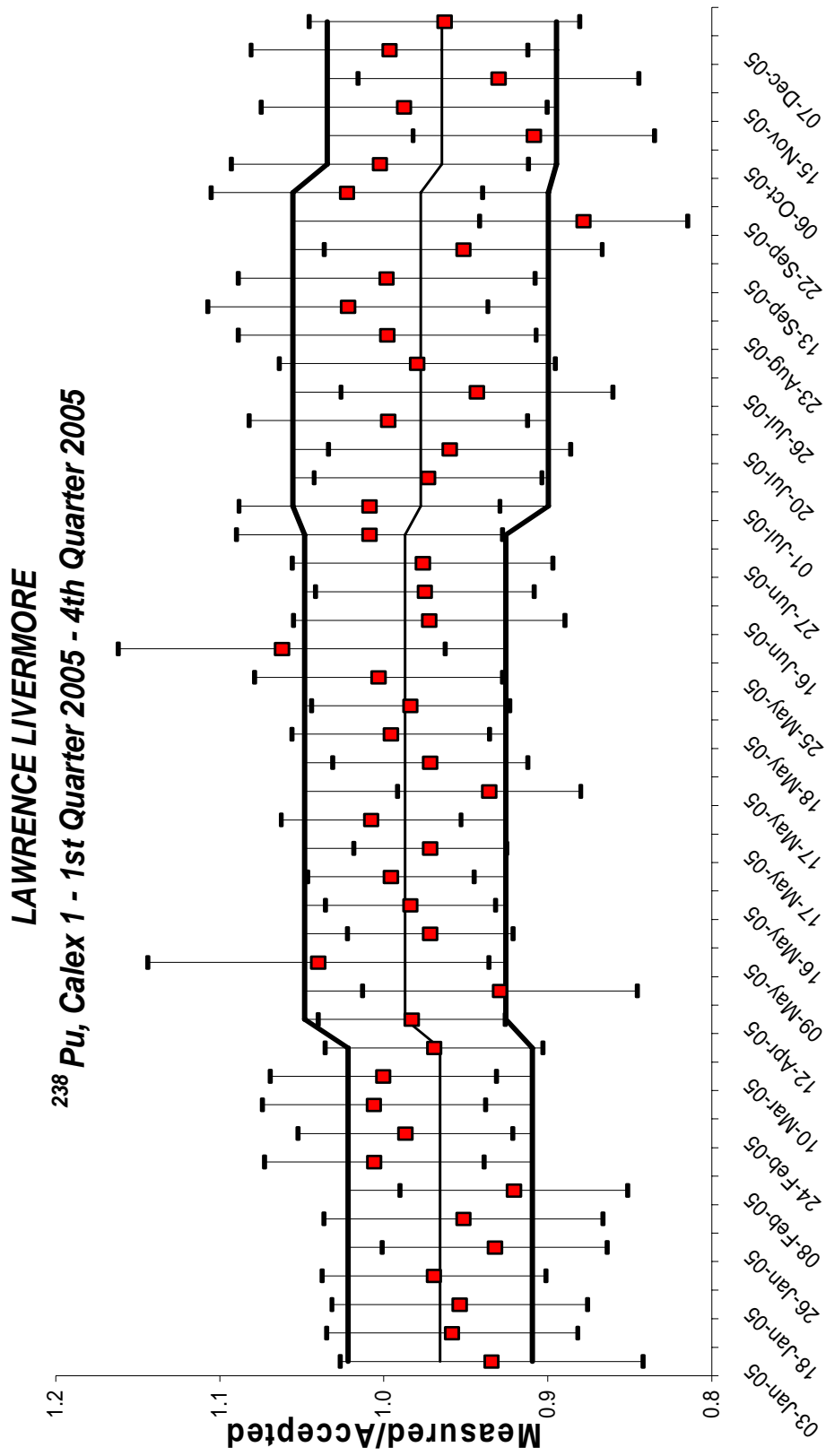
**Difference from Last Quarter in:**

|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0002% | -0.0001% |
| Standard deviation (weight %)    | 0.0000% | 0.0000%  |
| certainty in the Mean (weight %) | 0.0000% | 0.0000%  |
| Mean Error (%)                   | 2.55%   | -1.29%   |
| Standard Deviation (%)           | -0.51%  | -0.24%   |
| Uncertainty in the Mean (%)      | -0.27%  | 0.38%    |
| Number of Data Points            | 6       | -6       |
| Number of Outliers               | 0       | 0        |



**HANFORD**  
**<sup>238</sup>Pu, Calex 1**  
**1st Quarter 2005 - 4th Quarter 2005**





**RESULTS OF ANALYSIS OF Pu-238 DATA  
2005**

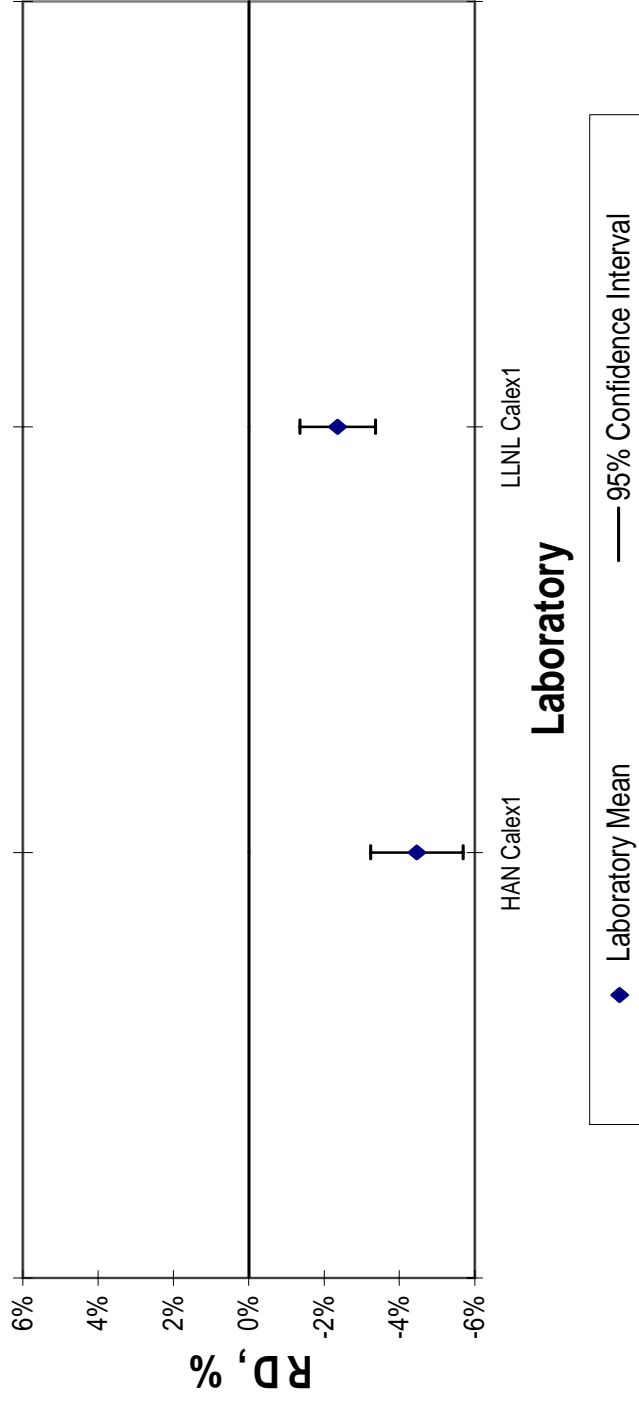
|                                  | Hanford Calex 1 | LLNL Calex 1 |
|----------------------------------|-----------------|--------------|
| Mean error (weight %)            | -0.0004%        | -0.0002%     |
| Standard deviation (weight %)    | 0.0005%         | 0.0003%      |
| certainty in the Mean (weight %) | 0.0001%         | 0.0000%      |
| Mean Error (%)                   | -4.46%          | -2.36%       |
| Standard Deviation (%)           | 6.04%           | 3.46%        |
| Uncertainty in the Mean (%)      | 0.61%           | 0.50%        |
| Number of Data Points            | 97              | 48           |
| Number of Outliers               | 0               | 0            |

**Difference from Last Year in:**

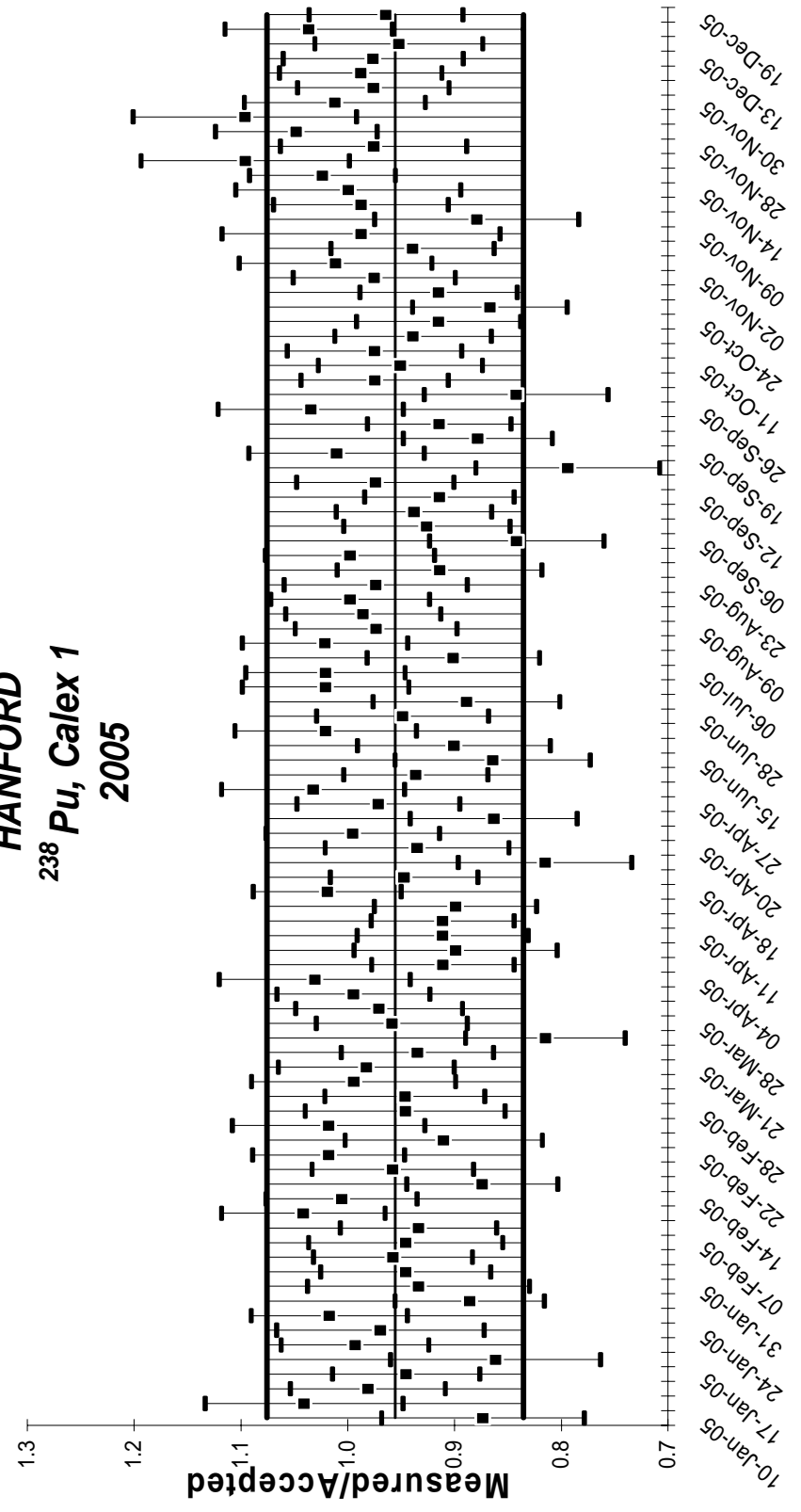
|                                  |          |         |
|----------------------------------|----------|---------|
| Mean error (weight %)            | -0.0001% | 0.0000% |
| Standard deviation (weight %)    | 0.0000%  | 0.0001% |
| certainty in the Mean (weight %) | 0.0001%  | 0.0000% |
| Mean Error (%)                   | -1.08%   | -0.51%  |
| Standard Deviation (%)           | 0.60%    | 0.52%   |
| Uncertainty in the Mean (%)      | -0.16%   | 0.16%   |
| Number of Data Points            | -50      | -28     |
| Number of Outliers               | -1       | 0       |

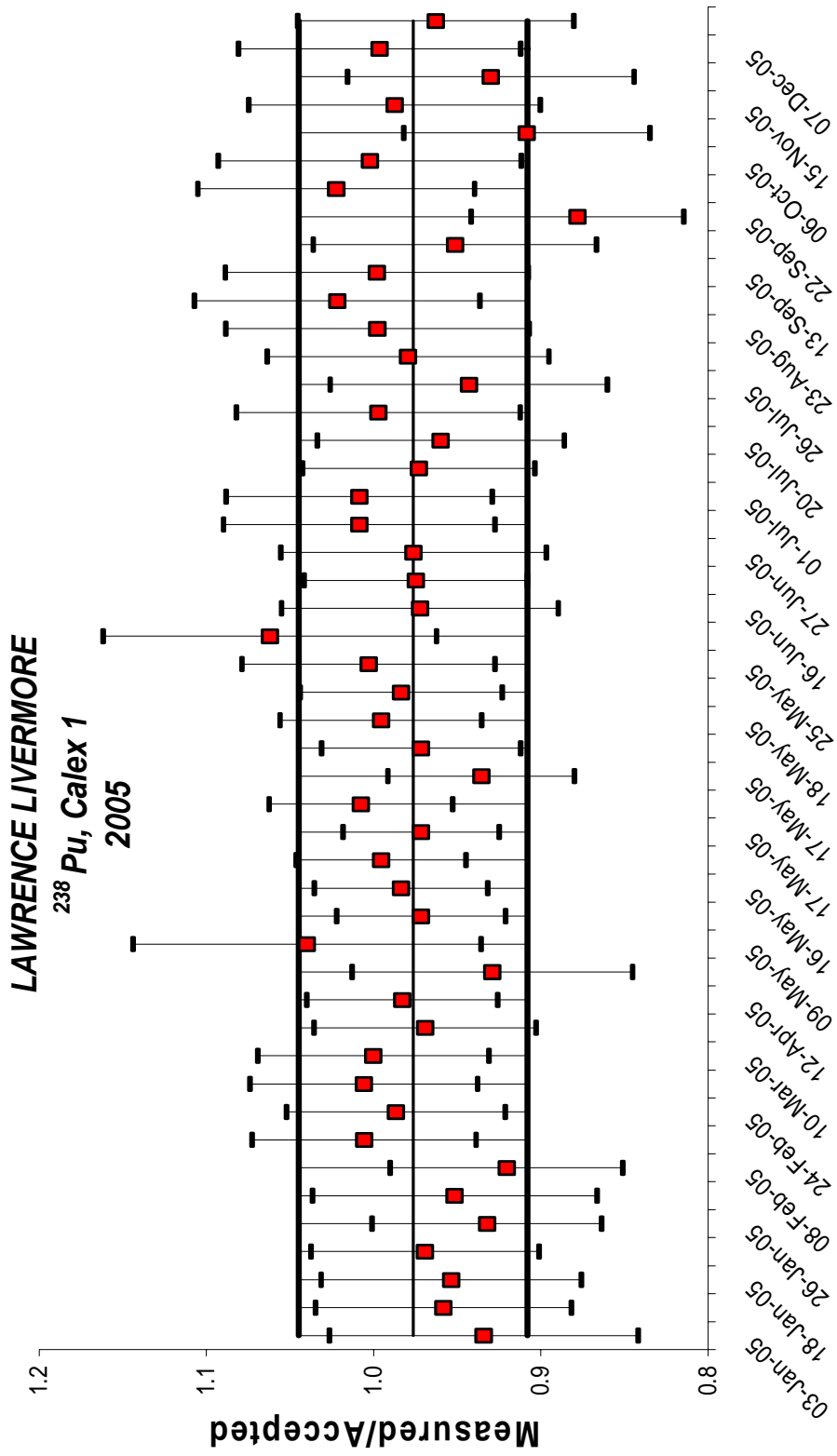
# New Brunswick Laboratory Calorimetry Exchange Program Percent <sup>238</sup>Pu, 2005

N=97                      N=48



**HANFORD**  
**<sup>238</sup>Pu, Calex 1**  
**2005**





**WEIGHT PERCENT 238-Pu DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #  | Date Measured | Instr. ID | 238-Pu  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|----|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|
| 1  | 10-Jan-05     | 2424      | 0.0073% | 6.22%         | 0.0084%           | 0.8733    | -0.0011%       | -12.67%       |
| 2  | 10-Jan-05     | 2026      | 0.0087% | 4.28%         | 0.0084%           | 1.0408    | 0.0003%        | 4.08%         |
| 3  | 11-Jan-05     | 2740      | 0.0082% | 3.77%         | 0.0084%           | 0.9810    | -0.0002%       | -1.90%        |
| 4  | 17-Jan-05     | 2740      | 0.0079% | 3.86%         | 0.0084%           | 0.9452    | -0.0005%       | -5.48%        |
| 5  | 18-Jan-05     | 2424      | 0.0072% | 6.63%         | 0.0084%           | 0.8615    | -0.0012%       | -13.85%       |
| 6  | 18-Jan-05     | 2026      | 0.0083% | 3.51%         | 0.0084%           | 0.9931    | -0.0001%       | -0.69%        |
| 7  | 24-Jan-05     | 2424      | 0.0081% | 5.17%         | 0.0084%           | 0.9692    | -0.0003%       | -3.08%        |
| 8  | 25-Jan-05     | 2026      | 0.0085% | 3.54%         | 0.0084%           | 1.0171    | 0.0001%        | 1.71%         |
| 9  | 26-Jan-05     | 2740      | 0.0074% | 4.46%         | 0.0084%           | 0.8855    | -0.0010%       | -11.45%       |
| 10 | 31-Jan-05     | 2424      | 0.0078% | 5.96%         | 0.0084%           | 0.9335    | -0.0006%       | -6.65%        |
| 11 | 31-Jan-05     | 2026      | 0.0079% | 4.45%         | 0.0084%           | 0.9454    | -0.0005%       | -5.46%        |
| 12 | 01-Feb-05     | 2740      | 0.0080% | 4.06%         | 0.0084%           | 0.9574    | -0.0004%       | -4.26%        |
| 13 | 07-Feb-05     | 2424      | 0.0079% | 5.08%         | 0.0084%           | 0.9457    | -0.0005%       | -5.43%        |
| 14 | 07-Feb-05     | 2026      | 0.0078% | 4.19%         | 0.0084%           | 0.9337    | -0.0006%       | -6.63%        |
| 15 | 08-Feb-05     | 2740      | 0.0087% | 3.53%         | 0.0084%           | 1.0414    | 0.0003%        | 4.14%         |
| 16 | 14-Feb-05     | 2740      | 0.0084% | 3.50%         | 0.0084%           | 1.0056    | 0.0000%        | 0.56%         |
| 17 | 16-Feb-05     | 2424      | 0.0073% | 4.63%         | 0.0084%           | 0.8739    | -0.0011%       | -12.61%       |
| 18 | 17-Feb-05     | 2026      | 0.0080% | 4.12%         | 0.0084%           | 0.9577    | -0.0004%       | -4.23%        |
| 19 | 22-Feb-05     | 2740      | 0.0085% | 3.44%         | 0.0084%           | 1.0177    | 0.0001%        | 1.77%         |
| 20 | 23-Feb-05     | 2424      | 0.0076% | 5.58%         | 0.0084%           | 0.9100    | -0.0008%       | -9.00%        |
| 21 | 23-Feb-05     | 2026      | 0.0085% | 4.36%         | 0.0084%           | 1.0177    | 0.0001%        | 1.77%         |
| 22 | 28-Feb-05     | 2424      | 0.0079% | 5.23%         | 0.0084%           | 0.9460    | -0.0005%       | -5.40%        |
| 23 | 14-Mar-05     | 2740      | 0.0079% | 4.18%         | 0.0083%           | 0.9463    | -0.0004%       | -5.37%        |
| 24 | 15-Mar-05     | 2424      | 0.0083% | 4.83%         | 0.0083%           | 0.9943    | 0.0000%        | -0.57%        |
| 25 | 21-Mar-05     | 2026      | 0.0082% | 4.26%         | 0.0083%           | 0.9824    | -0.0001%       | -1.76%        |
| 26 | 21-Mar-05     | 2740      | 0.0078% | 4.08%         | 0.0083%           | 0.9345    | -0.0005%       | -6.55%        |
| 27 | 22-Mar-05     | 2424      | 0.0068% | 5.64%         | 0.0083%           | 0.8147    | -0.0015%       | -18.53%       |
| 28 | 28-Mar-05     | 2026      | 0.0080% | 3.85%         | 0.0083%           | 0.9585    | -0.0003%       | -4.15%        |
| 29 | 29-Mar-05     | 2424      | 0.0081% | 4.14%         | 0.0083%           | 0.9705    | -0.0002%       | -2.95%        |
| 30 | 29-Mar-05     | 2740      | 0.0083% | 3.62%         | 0.0083%           | 0.9945    | 0.0000%        | -0.55%        |
| 31 | 04-Apr-05     | 2026      | 0.0086% | 4.21%         | 0.0083%           | 1.0307    | 0.0003%        | 3.07%         |
| 32 | 04-Apr-05     | 2740      | 0.0076% | 4.02%         | 0.0083%           | 0.9108    | -0.0007%       | -8.92%        |
| 33 | 05-Apr-05     | 2424      | 0.0075% | 5.89%         | 0.0083%           | 0.8988    | -0.0008%       | -10.12%       |
| 34 | 11-Apr-05     | 2026      | 0.0076% | 4.83%         | 0.0083%           | 0.9109    | -0.0007%       | -8.91%        |
| 35 | 12-Apr-05     | 2740      | 0.0076% | 4.03%         | 0.0083%           | 0.9109    | -0.0007%       | -8.91%        |
| 36 | 13-Apr-05     | 2424      | 0.0075% | 4.70%         | 0.0083%           | 0.8990    | -0.0008%       | -10.10%       |
| 37 | 18-Apr-05     | 2740      | 0.0085% | 3.34%         | 0.0083%           | 1.0189    | 0.0002%        | 1.89%         |
| 38 | 19-Apr-05     | 2026      | 0.0079% | 3.86%         | 0.0083%           | 0.9470    | -0.0004%       | -5.30%        |
| 39 | 19-Apr-05     | 2424      | 0.0068% | 6.11%         | 0.0083%           | 0.8152    | -0.0015%       | -18.48%       |
| 40 | 20-Apr-05     | 2424      | 0.0078% | 4.92%         | 0.0083%           | 0.9350    | -0.0005%       | -6.50%        |
| 41 | 25-Apr-05     | 2740      | 0.0083% | 4.10%         | 0.0083%           | 0.9951    | 0.0000%        | -0.49%        |
| 42 | 26-Apr-05     | 2424      | 0.0072% | 5.25%         | 0.0083%           | 0.8632    | -0.0011%       | -13.68%       |
| 43 | 27-Apr-05     | 2026      | 0.0081% | 4.04%         | 0.0083%           | 0.9712    | -0.0002%       | -2.88%        |
| 44 | 13-Jun-05     | 2026      | 0.0086% | 4.02%         | 0.0083%           | 1.0322    | 0.0003%        | 3.22%         |
| 45 | 14-Jun-05     | 2740      | 0.0078% | 3.85%         | 0.0083%           | 0.9361    | -0.0005%       | -6.39%        |
| 46 | 15-Jun-05     | 2424      | 0.0072% | 6.11%         | 0.0083%           | 0.8641    | -0.0011%       | -13.59%       |
| 47 | 27-Jun-05     | 2424      | 0.0075% | 5.56%         | 0.0083%           | 0.9005    | -0.0008%       | -9.95%        |
| 48 | 28-Jun-05     | 2026      | 0.0085% | 4.08%         | 0.0083%           | 1.0205    | 0.0002%        | 2.05%         |
| 49 | 28-Jun-05     | 2740      | 0.0079% | 4.48%         | 0.0083%           | 0.9485    | -0.0004%       | -5.15%        |
| 50 | 05-Jul-05     | 2424      | 0.0074% | 5.54%         | 0.0083%           | 0.8886    | -0.0009%       | -11.14%       |

**WEIGHT PERCENT 238-Pu DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #                   | Date Measured | Instr. ID | 238-Pu  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|---------------------|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|
| 51                  | 06-Jul-05     | 2026      | 0.0085% | 3.74%         | 0.0083%           | 1.0207    | 0.0002%        | 2.07%         |
| 52                  | 06-Jul-05     | 2740      | 0.0085% | 3.58%         | 0.0083%           | 1.0207    | 0.0002%        | 2.07%         |
| 53                  | 25-Jul-05     | 2424      | 0.0075% | 4.97%         | 0.0083%           | 0.9010    | -0.0008%       | -9.90%        |
| 54                  | 26-Jul-05     | 2026      | 0.0085% | 3.72%         | 0.0083%           | 1.0211    | 0.0002%        | 2.11%         |
| 55                  | 09-Aug-05     | 2026      | 0.0081% | 4.00%         | 0.0083%           | 0.9733    | -0.0002%       | -2.67%        |
| 56                  | 10-Aug-05     | 2740      | 0.0082% | 3.75%         | 0.0083%           | 0.9853    | -0.0001%       | -1.47%        |
| 57                  | 22-Aug-05     | 2740      | 0.0083% | 3.73%         | 0.0083%           | 0.9977    | 0.0000%        | -0.23%        |
| 58                  | 23-Aug-05     | 2026      | 0.0081% | 4.52%         | 0.0083%           | 0.9737    | -0.0002%       | -2.63%        |
| 59                  | 29-Aug-05     | 2424      | 0.0076% | 5.74%         | 0.0083%           | 0.9137    | -0.0007%       | -8.63%        |
| 60                  | 30-Aug-05     | 2026      | 0.0083% | 3.98%         | 0.0083%           | 0.9978    | 0.0000%        | -0.22%        |
| 61                  | 06-Sep-05     | 2424      | 0.0070% | 5.77%         | 0.0083%           | 0.8416    | -0.0013%       | -15.84%       |
| 62                  | 06-Sep-05     | 2026      | 0.0077% | 4.54%         | 0.0083%           | 0.9258    | -0.0006%       | -7.42%        |
| 63                  | 07-Sep-05     | 2740      | 0.0078% | 4.14%         | 0.0083%           | 0.9378    | -0.0005%       | -6.22%        |
| 64                  | 12-Sep-05     | 2740      | 0.0076% | 4.19%         | 0.0083%           | 0.9139    | -0.0007%       | -8.61%        |
| 65                  | 13-Sep-05     | 2026      | 0.0081% | 3.88%         | 0.0083%           | 0.9740    | -0.0002%       | -2.60%        |
| 66                  | 19-Sep-05     | 2424      | 0.0066% | 6.83%         | 0.0083%           | 0.7938    | -0.0017%       | -20.62%       |
| 67                  | 19-Sep-05     | 2026      | 0.0084% | 4.03%         | 0.0083%           | 1.0103    | 0.0001%        | 1.03%         |
| 68                  | 20-Sep-05     | 2740      | 0.0073% | 4.52%         | 0.0083%           | 0.8780    | -0.0010%       | -12.20%       |
| 69                  | 26-Sep-05     | 2740      | 0.0076% | 4.02%         | 0.0083%           | 0.9142    | -0.0007%       | -8.58%        |
| 70                  | 26-Sep-05     | 2026      | 0.0086% | 4.05%         | 0.0083%           | 1.0345    | 0.0003%        | 3.45%         |
| 71                  | 03-Oct-05     | 2424      | 0.0070% | 6.06%         | 0.0083%           | 0.8422    | -0.0013%       | -15.78%       |
| 72                  | 10-Oct-05     | 2740      | 0.0081% | 3.63%         | 0.0083%           | 0.9746    | -0.0002%       | -2.54%        |
| 73                  | 11-Oct-05     | 2026      | 0.0079% | 4.26%         | 0.0083%           | 0.9505    | -0.0004%       | -4.95%        |
| 74                  | 17-Oct-05     | 2026      | 0.0081% | 4.30%         | 0.0083%           | 0.9747    | -0.0002%       | -2.53%        |
| 75                  | 17-Oct-05     | 2740      | 0.0078% | 4.16%         | 0.0083%           | 0.9386    | -0.0005%       | -6.14%        |
| 76                  | 24-Oct-05     | 2740      | 0.0076% | 4.59%         | 0.0083%           | 0.9148    | -0.0007%       | -8.52%        |
| 77                  | 31-Oct-05     | 2740      | 0.0072% | 4.82%         | 0.0083%           | 0.8667    | -0.0011%       | -13.33%       |
| 78                  | 01-Nov-05     | 2026      | 0.0076% | 4.40%         | 0.0083%           | 0.9149    | -0.0007%       | -8.51%        |
| 79                  | 02-Nov-05     | 2740      | 0.0081% | 3.99%         | 0.0083%           | 0.9751    | -0.0002%       | -2.49%        |
| 80                  | 07-Nov-05     | 2026      | 0.0084% | 4.41%         | 0.0083%           | 1.0113    | 0.0001%        | 1.13%         |
| 81                  | 08-Nov-05     | 2740      | 0.0078% | 4.33%         | 0.0083%           | 0.9391    | -0.0005%       | -6.09%        |
| 82                  | 09-Nov-05     | 2347      | 0.0082% | 6.68%         | 0.0083%           | 0.9874    | -0.0001%       | -1.26%        |
| 83                  | 11-Nov-05     | 2347      | 0.0073% | 6.18%         | 0.0083%           | 0.8790    | -0.0010%       | -12.10%       |
| 84                  | 14-Nov-05     | 2026      | 0.0082% | 4.20%         | 0.0083%           | 0.9874    | -0.0001%       | -1.26%        |
| 85                  | 14-Nov-05     | 2347      | 0.0083% | 5.27%         | 0.0083%           | 0.9994    | 0.0000%        | -0.06%        |
| 86                  | 15-Nov-05     | 2740      | 0.0085% | 3.26%         | 0.0083%           | 1.0236    | 0.0002%        | 2.36%         |
| 87                  | 17-Nov-05     | 2347      | 0.0091% | 4.06%         | 0.0083%           | 1.0959    | 0.0008%        | 9.59%         |
| 88                  | 28-Nov-05     | 2026      | 0.0081% | 4.58%         | 0.0083%           | 0.9757    | -0.0002%       | -2.43%        |
| 89                  | 29-Nov-05     | 2740      | 0.0087% | 3.45%         | 0.0083%           | 1.0479    | 0.0004%        | 4.79%         |
| 90                  | 29-Nov-05     | 2347      | 0.0091% | 4.35%         | 0.0083%           | 1.0961    | 0.0008%        | 9.61%         |
| 91                  | 30-Nov-05     | 2347      | 0.0084% | 4.14%         | 0.0083%           | 1.0118    | 0.0001%        | 1.18%         |
| 92                  | 05-Dec-05     | 2026      | 0.0081% | 3.72%         | 0.0083%           | 0.9758    | -0.0002%       | -2.42%        |
| 93                  | 06-Dec-05     | 2740      | 0.0082% | 3.90%         | 0.0083%           | 0.9878    | -0.0001%       | -1.22%        |
| 94                  | 13-Dec-05     | 2026      | 0.0081% | 4.42%         | 0.0083%           | 0.9760    | -0.0002%       | -2.40%        |
| 95                  | 13-Dec-05     | 2740      | 0.0079% | 4.34%         | 0.0083%           | 0.9519    | -0.0004%       | -4.81%        |
| 96                  | 19-Dec-05     | 2026      | 0.0086% | 3.64%         | 0.0083%           | 1.0364    | 0.0003%        | 3.64%         |
| 97                  | 19-Dec-05     | 2740      | 0.0080% | 3.88%         | 0.0083%           | 0.9641    | -0.0003%       | -3.59%        |
| Mean:               |               |           |         |               |                   | 0.9554    | -0.0004%       | -4.46%        |
| Standard Deviation: |               |           |         |               |                   | 0.0604    | 0.0005%        | 6.04%         |
| Standard Error:     |               |           |         |               |                   | 0.0061    | 0.0001%        | 0.61%         |



**WEIGHT PERCENT 238-Pu DATA**  
**Calendar Year 2005**

**LLNL: Calex 1**

| #                   | Date Measured | Instr. ID | 238-Pu  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|---------------------|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|
| 1                   | 03-Jan-05     | 3         | 0.0078% | 5.29%         | 0.0084%           | 0.9341    | -0.0006%       | -6.59%        |
| 2                   | 11-Jan-05     | 2         | 0.0080% | 4.17%         | 0.0084%           | 0.9582    | -0.0003%       | -4.18%        |
| 3                   | 18-Jan-05     | 3         | 0.0080% | 4.28%         | 0.0084%           | 0.9536    | -0.0004%       | -4.64%        |
| 4                   | 25-Jan-05     | 1         | 0.0081% | 3.63%         | 0.0084%           | 0.9692    | -0.0003%       | -3.08%        |
| 5                   | 26-Jan-05     | 2         | 0.0078% | 3.95%         | 0.0084%           | 0.9322    | -0.0006%       | -6.78%        |
| 6                   | 27-Jan-05     | 3         | 0.0080% | 4.70%         | 0.0084%           | 0.9514    | -0.0004%       | -4.86%        |
| 7                   | 08-Feb-05     | 2         | 0.0077% | 4.10%         | 0.0084%           | 0.9205    | -0.0007%       | -7.95%        |
| 8                   | 14-Feb-05     | 1         | 0.0084% | 3.31%         | 0.0084%           | 1.0056    | 0.0000%        | 0.56%         |
| 9                   | 24-Feb-05     | 3         | 0.0082% | 3.36%         | 0.0084%           | 0.9867    | -0.0001%       | -1.33%        |
| 10                  | 28-Feb-05     | 1         | 0.0084% | 3.36%         | 0.0084%           | 1.0059    | 0.0000%        | 0.59%         |
| 11                  | 10-Mar-05     | 2         | 0.0084% | 3.45%         | 0.0083%           | 1.0001    | 0.0000%        | 0.01%         |
| 12                  | 21-Mar-05     | 3         | 0.0081% | 3.53%         | 0.0083%           | 0.9692    | -0.0003%       | -3.08%        |
| 13                  | 12-Apr-05     | 1         | 0.0082% | 2.95%         | 0.0083%           | 0.9829    | -0.0001%       | -1.71%        |
| 14                  | 18-Apr-05     | 3         | 0.0078% | 4.86%         | 0.0083%           | 0.9290    | -0.0006%       | -7.10%        |
| 15                  | 09-May-05     | 3         | 0.0087% | 4.81%         | 0.0083%           | 1.0398    | 0.0003%        | 3.98%         |
| 16                  | 16-May-05     | 1         | 0.0081% | 2.68%         | 0.0083%           | 0.9716    | -0.0002%       | -2.84%        |
| 17                  | 16-May-05     | 1         | 0.0082% | 2.68%         | 0.0083%           | 0.9836    | -0.0001%       | -1.64%        |
| 18                  | 17-May-05     | 1         | 0.0083% | 2.56%         | 0.0083%           | 0.9956    | 0.0000%        | -0.44%        |
| 19                  | 17-May-05     | 1         | 0.0081% | 2.47%         | 0.0083%           | 0.9716    | -0.0002%       | -2.84%        |
| 20                  | 17-May-05     | 1         | 0.0084% | 2.70%         | 0.0083%           | 1.0076    | 0.0001%        | 0.76%         |
| 21                  | 17-May-05     | 1         | 0.0078% | 3.19%         | 0.0083%           | 0.9356    | -0.0005%       | -6.44%        |
| 22                  | 18-May-05     | 1         | 0.0081% | 3.15%         | 0.0083%           | 0.9716    | -0.0002%       | -2.84%        |
| 23                  | 18-May-05     | 1         | 0.0083% | 3.04%         | 0.0083%           | 0.9956    | 0.0000%        | -0.44%        |
| 24                  | 18-May-05     | 1         | 0.0082% | 3.12%         | 0.0083%           | 0.9836    | -0.0001%       | -1.64%        |
| 25                  | 25-May-05     | 3         | 0.0084% | 3.76%         | 0.0083%           | 1.0030    | 0.0000%        | 0.30%         |
| 26                  | 07-Jun-05     | 3         | 0.0089% | 4.42%         | 0.0083%           | 1.0620    | 0.0005%        | 6.20%         |
| 27                  | 16-Jun-05     | 1         | 0.0081% | 4.38%         | 0.0083%           | 0.9723    | -0.0002%       | -2.77%        |
| 28                  | 22-Jun-05     | 3         | 0.0081% | 3.51%         | 0.0083%           | 0.9748    | -0.0002%       | -2.52%        |
| 29                  | 27-Jun-05     | 3         | 0.0081% | 4.17%         | 0.0083%           | 0.9761    | -0.0002%       | -2.39%        |
| 30                  | 28-Jun-05     | 1         | 0.0084% | 3.99%         | 0.0083%           | 1.0085    | 0.0001%        | 0.85%         |
| 31                  | 01-Jul-05     | 1         | 0.0084% | 3.91%         | 0.0083%           | 1.0085    | 0.0001%        | 0.85%         |
| 32                  | 14-Jul-05     | 1         | 0.0081% | 3.67%         | 0.0083%           | 0.9729    | -0.0002%       | -2.71%        |
| 33                  | 20-Jul-05     | 3         | 0.0080% | 4.01%         | 0.0083%           | 0.9598    | -0.0003%       | -4.02%        |
| 34                  | 25-Jul-05     | 1         | 0.0083% | 4.27%         | 0.0083%           | 0.9971    | 0.0000%        | -0.29%        |
| 35                  | 26-Jul-05     | 3         | 0.0079% | 4.66%         | 0.0083%           | 0.9431    | -0.0005%       | -5.69%        |
| 36                  | 15-Aug-05     | 3         | 0.0082% | 4.39%         | 0.0083%           | 0.9794    | -0.0002%       | -2.06%        |
| 37                  | 23-Aug-05     | 1         | 0.0083% | 4.56%         | 0.0083%           | 0.9977    | 0.0000%        | -0.23%        |
| 38                  | 26-Aug-05     | 1         | 0.0085% | 4.09%         | 0.0083%           | 1.0218    | 0.0002%        | 2.18%         |
| 39                  | 13-Sep-05     | 1         | 0.0083% | 4.54%         | 0.0083%           | 0.9981    | 0.0000%        | -0.19%        |
| 40                  | 19-Sep-05     | 3         | 0.0079% | 4.68%         | 0.0083%           | 0.9514    | -0.0004%       | -4.86%        |
| 41                  | 22-Sep-05     | 2         | 0.0073% | 4.12%         | 0.0083%           | 0.8780    | -0.0010%       | -12.20%       |
| 42                  | 23-Sep-05     | 2         | 0.0085% | 3.96%         | 0.0083%           | 1.0224    | 0.0002%        | 2.24%         |
| 43                  | 06-Oct-05     | 3         | 0.0083% | 4.51%         | 0.0083%           | 1.0023    | 0.0000%        | 0.23%         |
| 44                  | 11-Oct-05     | 3         | 0.0076% | 4.46%         | 0.0083%           | 0.9084    | -0.0008%       | -9.16%        |
| 45                  | 15-Nov-05     | 1         | 0.0082% | 4.47%         | 0.0083%           | 0.9875    | -0.0001%       | -1.25%        |
| 46                  | 29-Nov-05     | 2         | 0.0077% | 4.95%         | 0.0083%           | 0.9299    | -0.0006%       | -7.01%        |
| 47                  | 07-Dec-05     | 2         | 0.0083% | 4.25%         | 0.0083%           | 0.9964    | 0.0000%        | -0.36%        |
| 48                  | 20-Dec-05     | 2         | 0.0080% | 4.45%         | 0.0083%           | 0.9629    | -0.0003%       | -3.71%        |
| Mean:               |               |           |         |               |                   | 0.9764    | -0.0002%       | -2.36%        |
| Standard Deviation: |               |           |         |               |                   | 0.0346    | 0.0003%        | 3.46%         |
| Standard Error:     |               |           |         |               |                   | 0.0050    | 0.0000%        | 0.50%         |



**K.  $^{239}\text{Pu}$  ISOTOPE ABUNDANCE TABLES AND GRAPHS**



**RESULTS OF ANALYSIS OF Pu-239 DATA**  
**1st QUARTER 2005**

|                                  | Hanford Calex 1 | LLNL Calex 1 |
|----------------------------------|-----------------|--------------|
| Mean error (weight %)            | -0.0289%        | 0.0065%      |
| Standard deviation (weight %)    | 0.0514%         | 0.0150%      |
| certainty in the Mean (weight %) | 0.0094%         | 0.0043%      |
| Mean Error (%)                   | -0.03%          | 0.01%        |
| Standard Deviation (%)           | 0.05%           | 0.02%        |
| Uncertainty in the Mean (%)      | 0.01%           | 0.00%        |
| Number of Data Points            | 30              | 12           |
| Number of Outliers               | 0               | 0            |

**Difference from Last Quarter in:**

|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0019% | -0.0009% |
| Standard deviation (weight %)    | 0.0149% | -0.0079% |
| certainty in the Mean (weight %) | 0.0022% | -0.0023% |
| Mean Error (%)                   | 0.00%   | 0.00%    |
| Standard Deviation (%)           | 0.01%   | 0.00%    |
| Uncertainty in the Mean (%)      | 0.00%   | 0.00%    |
| Number of Data Points            | 4       | 0        |
| Number of Outliers               | 0       | 0        |

**RESULTS OF ANALYSIS OF Pu-239 DATA**  
**2nd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                                  |          |         |
|----------------------------------|----------|---------|
| Mean error (weight %)            | -0.0251% | 0.0015% |
| Standard deviation (weight %)    | 0.0511%  | 0.0147% |
| certainty in the Mean (weight %) | 0.0117%  | 0.0035% |
| Mean Error (%)                   | -0.03%   | 0.00%   |
| Standard Deviation (%)           | 0.05%    | 0.02%   |
| Uncertainty in the Mean (%)      | 0.01%    | 0.00%   |
| Number of Data Points            | 19       | 18      |
| Number of Outliers               | 0        | 0       |

**Difference from Last Quarter in:**

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | 0.0038%  | -0.0050% |
| Standard deviation (weight %)    | -0.0003% | -0.0003% |
| certainty in the Mean (weight %) | 0.0023%  | -0.0008% |
| Mean Error (%)                   | 0.00%    | -0.01%   |
| Standard Deviation (%)           | 0.00%    | 0.00%    |
| Uncertainty in the Mean (%)      | 0.00%    | 0.00%    |
| Number of Data Points            | -11      | 6        |
| Number of Outliers               | 0        | 0        |

**RESULTS OF ANALYSIS OF Pu-239 DATA**  
**3rd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | -0.0141% | -0.0005% |
| Standard deviation (weight %)    | 0.0536%  | 0.0183%  |
| certainty in the Mean (weight %) | 0.0117%  | 0.0053%  |
| Mean Error (%)                   | -0.02%   | 0.00%    |
| Standard Deviation (%)           | 0.06%    | 0.02%    |
| Uncertainty in the Mean (%)      | 0.01%    | 0.01%    |
| Number of Data Points            | 21       | 12       |
| Number of Outliers               | 0        | 0        |

**Difference from Last Quarter in:**

|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0110% | -0.0020% |
| Standard deviation (weight %)    | 0.0025% | 0.0036%  |
| certainty in the Mean (weight %) | 0.0000% | 0.0018%  |
| Mean Error (%)                   | 0.01%   | 0.00%    |
| Standard Deviation (%)           | 0.01%   | 0.00%    |
| Uncertainty in the Mean (%)      | 0.00%   | 0.01%    |
| Number of Data Points            | 2       | -6       |
| Number of Outliers               | 0       | 0        |

**RESULTS OF ANALYSIS OF Pu-239 DATA  
4th QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

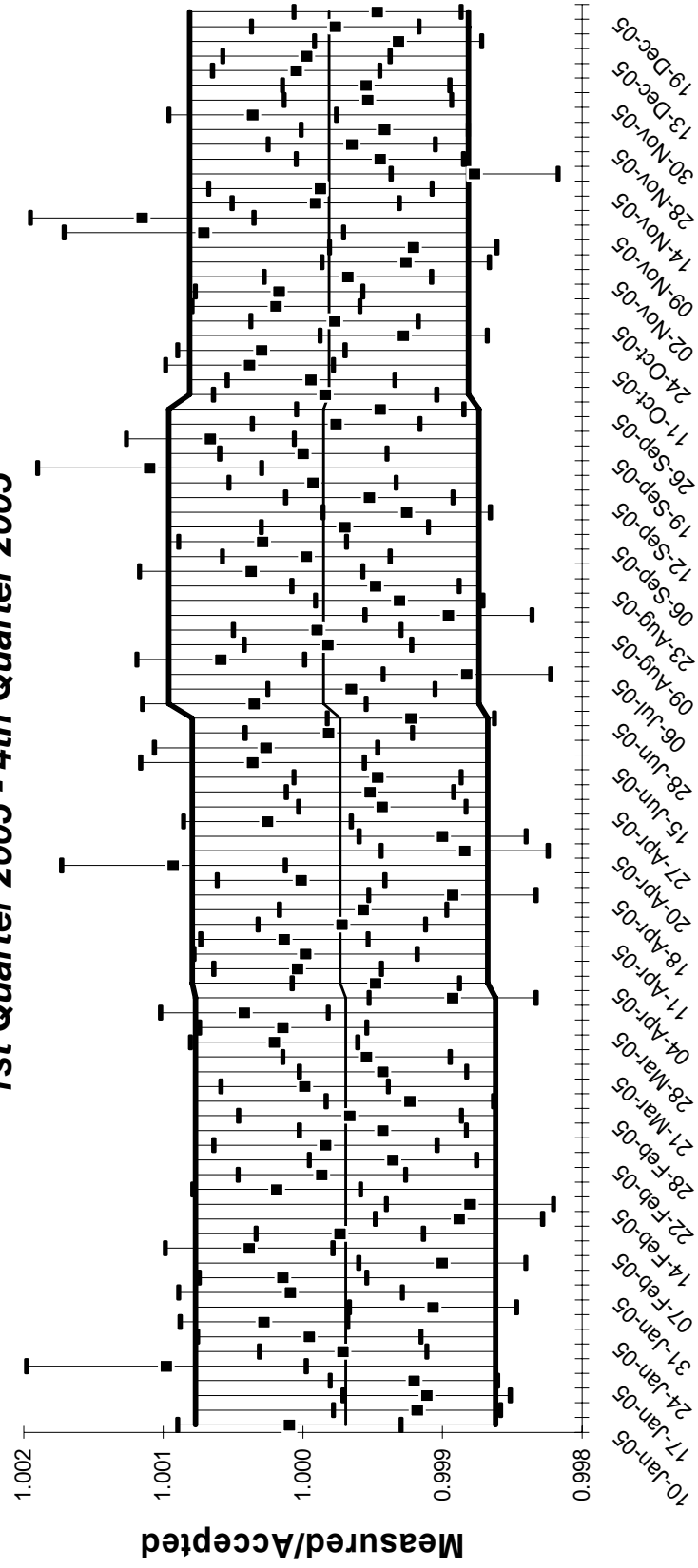
|                                  |          |         |
|----------------------------------|----------|---------|
| Mean error (weight %)            | -0.0177% | 0.0011% |
| Standard deviation (weight %)    | 0.0478%  | 0.0353% |
| certainty in the Mean (weight %) | 0.0092%  | 0.0144% |
| Mean Error (%)                   | -0.02%   | 0.00%   |
| Standard Deviation (%)           | 0.05%    | 0.04%   |
| Uncertainty in the Mean (%)      | 0.01%    | 0.02%   |
| Number of Data Points            | 27       | 6       |
| Number of Outliers               | 0        | 0       |

**Difference from Last Quarter in:**

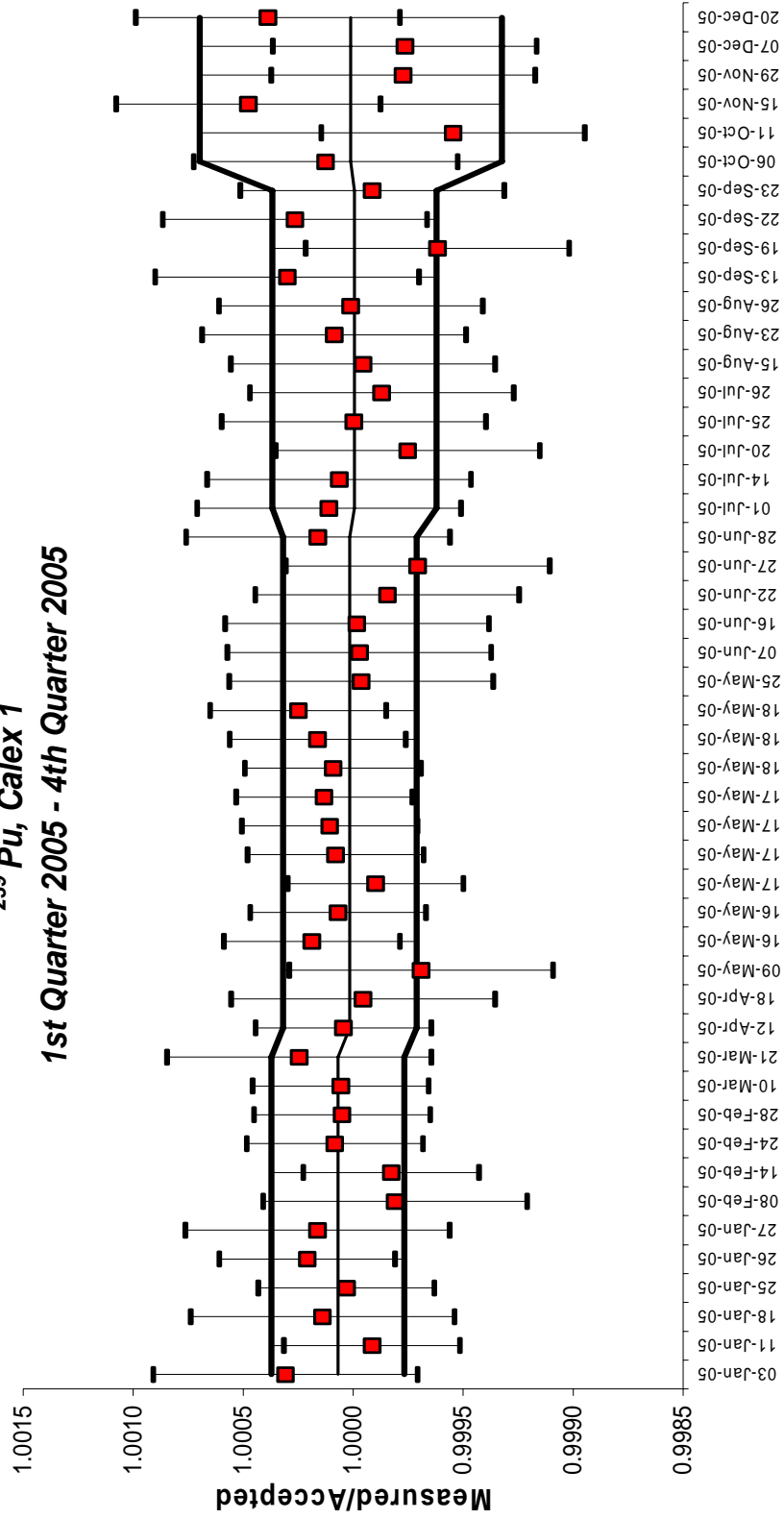
|                                  |          |         |
|----------------------------------|----------|---------|
| Mean error (weight %)            | -0.0036% | 0.0016% |
| Standard deviation (weight %)    | -0.0058% | 0.0170% |
| certainty in the Mean (weight %) | -0.0025% | 0.0091% |
| Mean Error (%)                   | 0.00%    | 0.00%   |
| Standard Deviation (%)           | -0.01%   | 0.02%   |
| Uncertainty in the Mean (%)      | 0.00%    | 0.01%   |
| Number of Data Points            | 6        | -6      |
| Number of Outliers               | 0        | 0       |



**HANFORD**  
**<sup>239</sup>Pu, Calex 1**  
**1st Quarter 2005 - 4th Quarter 2005**



**LAWRENCE LIVERMORE**  
**<sup>239</sup>Pu, Calex 1**  
**1st Quarter 2005 - 4th Quarter 2005**



**RESULTS OF ANALYSIS OF Pu-239 DATA  
2005**

|                                  | Hanford Calex 1 | LLNL Calex 1 |
|----------------------------------|-----------------|--------------|
| Mean error (weight %)            | -0.0218%        | 0.0022%      |
| Standard deviation (weight %)    | 0.0504%         | 0.0186%      |
| certainty in the Mean (weight %) | 0.0051%         | 0.0027%      |
| Mean Error (%)                   | -0.02%          | 0.00%        |
| Standard Deviation (%)           | 0.05%           | 0.02%        |
| Uncertainty in the Mean (%)      | 0.01%           | 0.00%        |
| Number of Data Points            | 97              | 48           |
| Number of Outliers               | 0               | 0            |

**Difference from Last Year in:**

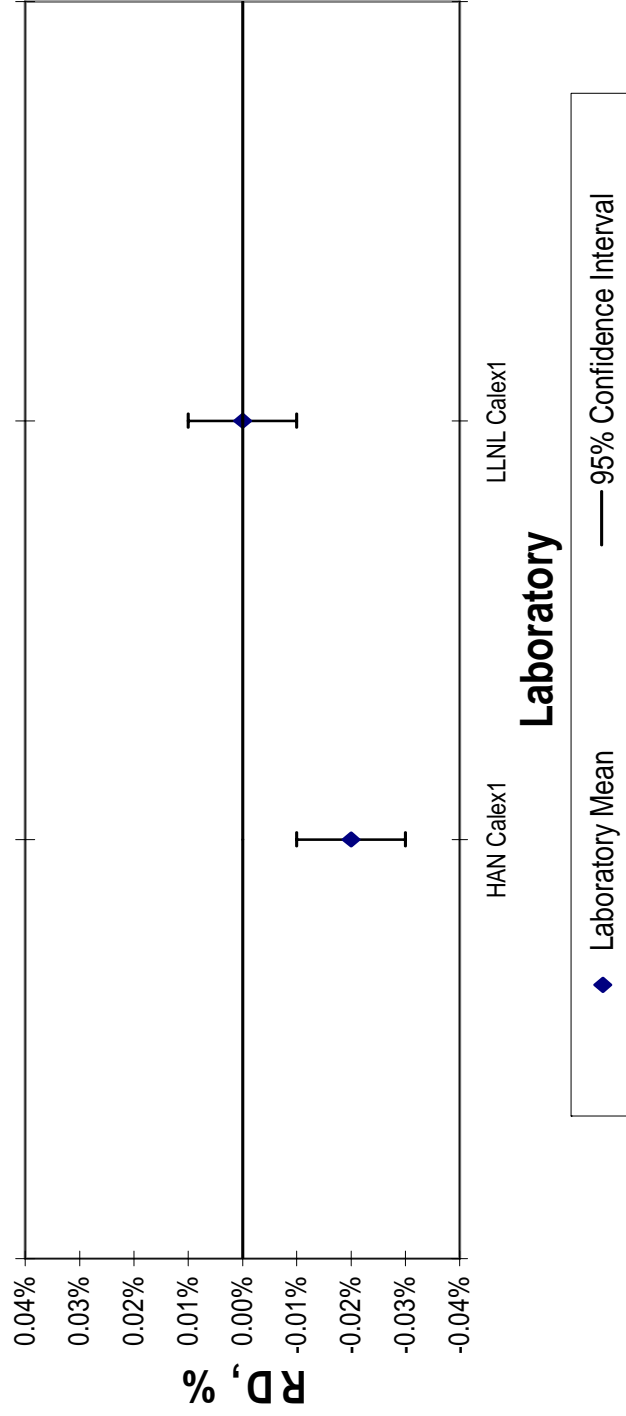
|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0078% | -0.0070% |
| Standard deviation (weight %)    | 0.0113% | -0.0051% |
| certainty in the Mean (weight %) | 0.0019% | 0.0000%  |
| Mean Error (%)                   | 0.01%   | -0.01%   |
| Standard Deviation (%)           | 0.01%   | -0.01%   |
| Uncertainty in the Mean (%)      | 0.01%   | 0.00%    |
| Number of Data Points            | -50     | -28      |
| Number of Outliers               | -1      | 0        |

# New Brunswick Laboratory Calorimetry Exchange Program

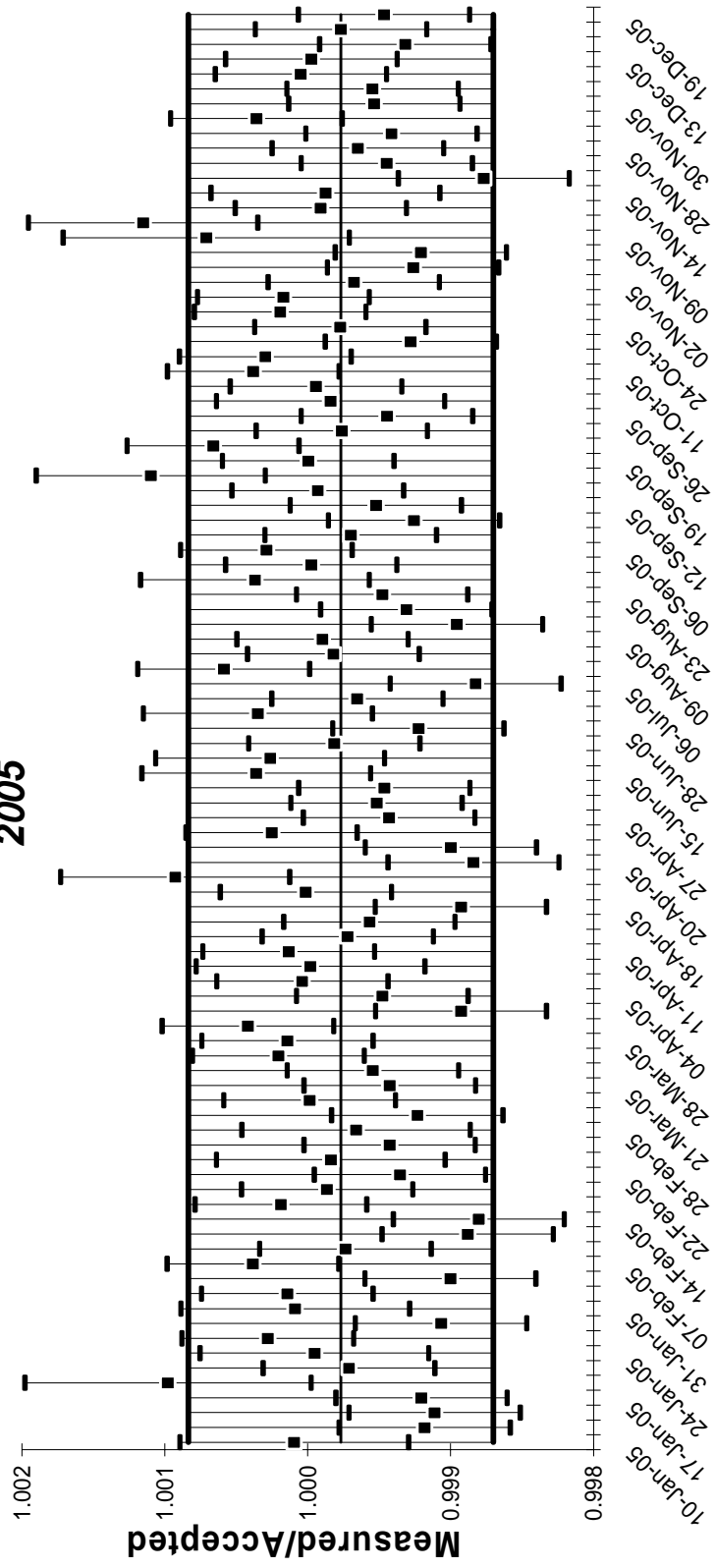
## Percent $^{239}\text{Pu}$ , 2005

N=97

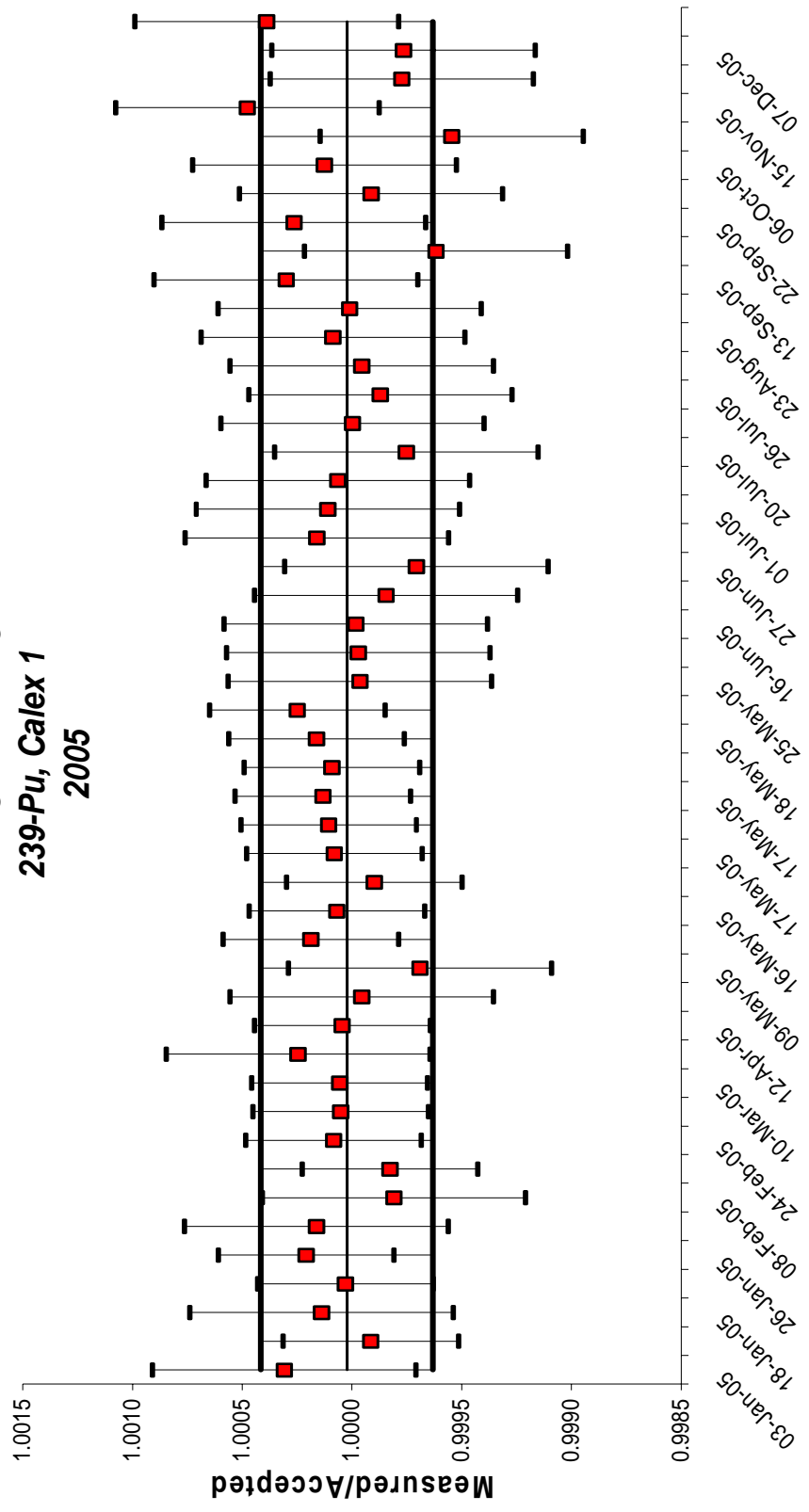
N=48



**HANFORD**  
**<sup>239</sup>Pu, Calex 1**  
**2005**



**LAWRENCE LIVERMORE**  
**239-Pu, Calex 1**  
**2005**



**WEIGHT PERCENT 239-Pu DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #  | Date Measured | Instr. ID | 239-Pu   | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|----|---------------|-----------|----------|---------------|-------------------|-----------|----------------|---------------|
| 1  | 10-Jan-05     | 2424      | 94.0026% | 0.04%         | 93.9938%          | 1.0001    | 0.0088%        | 0.01%         |
| 2  | 10-Jan-05     | 2026      | 93.9167% | 0.03%         | 93.9938%          | 0.9992    | -0.0771%       | -0.08%        |
| 3  | 11-Jan-05     | 2740      | 93.9102% | 0.03%         | 93.9938%          | 0.9991    | -0.0836%       | -0.09%        |
| 4  | 17-Jan-05     | 2740      | 93.9189% | 0.03%         | 93.9939%          | 0.9992    | -0.0750%       | -0.08%        |
| 5  | 18-Jan-05     | 2424      | 94.0857% | 0.05%         | 93.9939%          | 1.0010    | 0.0918%        | 0.10%         |
| 6  | 18-Jan-05     | 2026      | 93.9666% | 0.03%         | 93.9939%          | 0.9997    | -0.0273%       | -0.03%        |
| 7  | 24-Jan-05     | 2424      | 93.9894% | 0.04%         | 93.9940%          | 1.0000    | -0.0046%       | 0.00%         |
| 8  | 25-Jan-05     | 2026      | 94.0201% | 0.03%         | 93.9940%          | 1.0003    | 0.0261%        | 0.03%         |
| 9  | 26-Jan-05     | 2740      | 93.9062% | 0.03%         | 93.9940%          | 0.9991    | -0.0878%       | -0.09%        |
| 10 | 31-Jan-05     | 2424      | 94.0022% | 0.04%         | 93.9941%          | 1.0001    | 0.0081%        | 0.01%         |
| 11 | 31-Jan-05     | 2026      | 94.0074% | 0.03%         | 93.9941%          | 1.0001    | 0.0133%        | 0.01%         |
| 12 | 01-Feb-05     | 2740      | 93.9001% | 0.03%         | 93.9941%          | 0.9990    | -0.0940%       | -0.10%        |
| 13 | 07-Feb-05     | 2424      | 94.0302% | 0.03%         | 93.9942%          | 1.0004    | 0.0360%        | 0.04%         |
| 14 | 07-Feb-05     | 2026      | 93.9692% | 0.03%         | 93.9942%          | 0.9997    | -0.0250%       | -0.03%        |
| 15 | 08-Feb-05     | 2740      | 93.8889% | 0.03%         | 93.9942%          | 0.9989    | -0.1053%       | -0.11%        |
| 16 | 14-Feb-05     | 2740      | 93.8816% | 0.03%         | 93.9943%          | 0.9988    | -0.1127%       | -0.12%        |
| 17 | 16-Feb-05     | 2424      | 94.0118% | 0.03%         | 93.9943%          | 1.0002    | 0.0175%        | 0.02%         |
| 18 | 17-Feb-05     | 2026      | 93.9814% | 0.03%         | 93.9943%          | 0.9999    | -0.0129%       | -0.01%        |
| 19 | 22-Feb-05     | 2740      | 93.9336% | 0.03%         | 93.9944%          | 0.9994    | -0.0608%       | -0.06%        |
| 20 | 23-Feb-05     | 2424      | 93.9791% | 0.04%         | 93.9944%          | 0.9998    | -0.0153%       | -0.02%        |
| 21 | 23-Feb-05     | 2026      | 93.9404% | 0.03%         | 93.9944%          | 0.9994    | -0.0540%       | -0.06%        |
| 22 | 28-Feb-05     | 2424      | 93.9626% | 0.04%         | 93.9945%          | 0.9997    | -0.0319%       | -0.03%        |
| 23 | 14-Mar-05     | 2740      | 93.9225% | 0.03%         | 93.9947%          | 0.9992    | -0.0722%       | -0.08%        |
| 24 | 15-Mar-05     | 2424      | 93.9933% | 0.03%         | 93.9947%          | 1.0000    | -0.0014%       | 0.00%         |
| 25 | 21-Mar-05     | 2026      | 93.9407% | 0.03%         | 93.9948%          | 0.9994    | -0.0541%       | -0.06%        |
| 26 | 21-Mar-05     | 2740      | 93.9518% | 0.03%         | 93.9948%          | 0.9995    | -0.0430%       | -0.05%        |
| 27 | 22-Mar-05     | 2424      | 94.0140% | 0.03%         | 93.9948%          | 1.0002    | 0.0192%        | 0.02%         |
| 28 | 28-Mar-05     | 2026      | 94.0081% | 0.03%         | 93.9949%          | 1.0001    | 0.0132%        | 0.01%         |
| 29 | 29-Mar-05     | 2424      | 94.0341% | 0.03%         | 93.9949%          | 1.0004    | 0.0392%        | 0.04%         |
| 30 | 29-Mar-05     | 2740      | 93.8939% | 0.03%         | 93.9949%          | 0.9989    | -0.1010%       | -0.11%        |
| 31 | 04-Apr-05     | 2026      | 93.9458% | 0.03%         | 93.9950%          | 0.9995    | -0.0492%       | -0.05%        |
| 32 | 04-Apr-05     | 2740      | 93.9984% | 0.03%         | 93.9950%          | 1.0000    | 0.0034%        | 0.00%         |
| 33 | 05-Apr-05     | 2424      | 93.9931% | 0.04%         | 93.9950%          | 1.0000    | -0.0019%       | 0.00%         |
| 34 | 11-Apr-05     | 2026      | 94.0074% | 0.03%         | 93.9951%          | 1.0001    | 0.0123%        | 0.01%         |
| 35 | 12-Apr-05     | 2740      | 93.9687% | 0.03%         | 93.9951%          | 0.9997    | -0.0264%       | -0.03%        |
| 36 | 13-Apr-05     | 2424      | 93.9544% | 0.03%         | 93.9951%          | 0.9996    | -0.0407%       | -0.04%        |
| 37 | 18-Apr-05     | 2740      | 93.8943% | 0.03%         | 93.9952%          | 0.9989    | -0.1009%       | -0.11%        |
| 38 | 19-Apr-05     | 2026      | 93.9963% | 0.03%         | 93.9952%          | 1.0000    | 0.0011%        | 0.00%         |
| 39 | 19-Apr-05     | 2424      | 94.0823% | 0.04%         | 93.9952%          | 1.0009    | 0.0871%        | 0.09%         |
| 40 | 20-Apr-05     | 2424      | 93.8861% | 0.03%         | 93.9952%          | 0.9988    | -0.1091%       | -0.12%        |
| 41 | 25-Apr-05     | 2740      | 93.9010% | 0.03%         | 93.9953%          | 0.9990    | -0.0943%       | -0.10%        |
| 42 | 26-Apr-05     | 2424      | 94.0190% | 0.03%         | 93.9953%          | 1.0003    | 0.0237%        | 0.03%         |
| 43 | 27-Apr-05     | 2026      | 93.9417% | 0.03%         | 93.9954%          | 0.9994    | -0.0537%       | -0.06%        |
| 44 | 13-Jun-05     | 2026      | 93.9506% | 0.03%         | 93.9960%          | 0.9995    | -0.0454%       | -0.05%        |
| 45 | 14-Jun-05     | 2740      | 93.9455% | 0.03%         | 93.9960%          | 0.9995    | -0.0505%       | -0.05%        |
| 46 | 15-Jun-05     | 2424      | 94.0298% | 0.04%         | 93.9961%          | 1.0004    | 0.0337%        | 0.04%         |
| 47 | 27-Jun-05     | 2424      | 94.0208% | 0.04%         | 93.9962%          | 1.0003    | 0.0246%        | 0.03%         |
| 48 | 28-Jun-05     | 2026      | 93.9787% | 0.03%         | 93.9962%          | 0.9998    | -0.0175%       | -0.02%        |
| 49 | 28-Jun-05     | 2740      | 93.9233% | 0.03%         | 93.9962%          | 0.9992    | -0.0729%       | -0.08%        |
| 50 | 05-Jul-05     | 2424      | 94.0290% | 0.04%         | 93.9964%          | 1.0003    | 0.0327%        | 0.03%         |

**WEIGHT PERCENT 239-Pu DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #                   | Date Measured | Instr. ID | 239-Pu   | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|---------------------|---------------|-----------|----------|---------------|-------------------|-----------|----------------|---------------|
| 51                  | 06-Jul-05     | 2026      | 93.9636% | 0.03%         | 93.9964%          | 0.9997    | -0.0328%       | -0.03%        |
| 52                  | 06-Jul-05     | 2740      | 93.8858% | 0.03%         | 93.9964%          | 0.9988    | -0.1106%       | -0.12%        |
| 53                  | 25-Jul-05     | 2424      | 94.0518% | 0.03%         | 93.9966%          | 1.0006    | 0.0552%        | 0.06%         |
| 54                  | 26-Jul-05     | 2026      | 93.9796% | 0.03%         | 93.9967%          | 0.9998    | -0.0171%       | -0.02%        |
| 55                  | 09-Aug-05     | 2026      | 93.9870% | 0.03%         | 93.9969%          | 0.9999    | -0.0099%       | -0.01%        |
| 56                  | 10-Aug-05     | 2740      | 93.8986% | 0.03%         | 93.9969%          | 0.9990    | -0.0983%       | -0.10%        |
| 57                  | 22-Aug-05     | 2740      | 93.9320% | 0.03%         | 93.9970%          | 0.9993    | -0.0650%       | -0.07%        |
| 58                  | 23-Aug-05     | 2026      | 93.9479% | 0.03%         | 93.9971%          | 0.9995    | -0.0492%       | -0.05%        |
| 59                  | 29-Aug-05     | 2424      | 94.0317% | 0.04%         | 93.9971%          | 1.0004    | 0.0346%        | 0.04%         |
| 60                  | 30-Aug-05     | 2026      | 93.9947% | 0.03%         | 93.9972%          | 1.0000    | -0.0025%       | 0.00%         |
| 61                  | 06-Sep-05     | 2424      | 94.0243% | 0.03%         | 93.9973%          | 1.0003    | 0.0270%        | 0.03%         |
| 62                  | 06-Sep-05     | 2026      | 93.9688% | 0.03%         | 93.9973%          | 0.9997    | -0.0285%       | -0.03%        |
| 63                  | 07-Sep-05     | 2740      | 93.9272% | 0.03%         | 93.9973%          | 0.9993    | -0.0701%       | -0.07%        |
| 64                  | 12-Sep-05     | 2740      | 93.9524% | 0.03%         | 93.9973%          | 0.9995    | -0.0449%       | -0.05%        |
| 65                  | 13-Sep-05     | 2026      | 93.9906% | 0.03%         | 93.9974%          | 0.9999    | -0.0068%       | -0.01%        |
| 66                  | 19-Sep-05     | 2424      | 94.1005% | 0.04%         | 93.9974%          | 1.0011    | 0.1031%        | 0.11%         |
| 67                  | 19-Sep-05     | 2026      | 93.9970% | 0.03%         | 93.9974%          | 1.0000    | -0.0004%       | 0.00%         |
| 68                  | 20-Sep-05     | 2740      | 94.0596% | 0.03%         | 93.9975%          | 1.0007    | 0.0621%        | 0.07%         |
| 69                  | 26-Sep-05     | 2740      | 93.9750% | 0.03%         | 93.9975%          | 0.9998    | -0.0225%       | -0.02%        |
| 70                  | 26-Sep-05     | 2026      | 93.9453% | 0.03%         | 93.9975%          | 0.9994    | -0.0522%       | -0.06%        |
| 71                  | 03-Oct-05     | 2424      | 93.9825% | 0.04%         | 93.9976%          | 0.9998    | -0.0151%       | -0.02%        |
| 72                  | 10-Oct-05     | 2740      | 93.9921% | 0.03%         | 93.9977%          | 0.9999    | -0.0056%       | -0.01%        |
| 73                  | 11-Oct-05     | 2026      | 94.0335% | 0.03%         | 93.9978%          | 1.0004    | 0.0357%        | 0.04%         |
| 74                  | 17-Oct-05     | 2026      | 94.0256% | 0.03%         | 93.9978%          | 1.0003    | 0.0278%        | 0.03%         |
| 75                  | 17-Oct-05     | 2740      | 93.9299% | 0.03%         | 93.9978%          | 0.9993    | -0.0679%       | -0.07%        |
| 76                  | 24-Oct-05     | 2740      | 93.9764% | 0.03%         | 93.9979%          | 0.9998    | -0.0215%       | -0.02%        |
| 77                  | 31-Oct-05     | 2740      | 94.0160% | 0.03%         | 93.9980%          | 1.0002    | 0.0180%        | 0.02%         |
| 78                  | 01-Nov-05     | 2026      | 94.0139% | 0.03%         | 93.9981%          | 1.0002    | 0.0158%        | 0.02%         |
| 79                  | 02-Nov-05     | 2740      | 93.9676% | 0.03%         | 93.9981%          | 0.9997    | -0.0305%       | -0.03%        |
| 80                  | 07-Nov-05     | 2026      | 93.9287% | 0.03%         | 93.9981%          | 0.9993    | -0.0694%       | -0.07%        |
| 81                  | 08-Nov-05     | 2740      | 93.9236% | 0.03%         | 93.9982%          | 0.9992    | -0.0746%       | -0.08%        |
| 82                  | 09-Nov-05     | 2347      | 94.0647% | 0.05%         | 93.9982%          | 1.0007    | 0.0665%        | 0.07%         |
| 83                  | 11-Nov-05     | 2347      | 94.1063% | 0.04%         | 93.9982%          | 1.0012    | 0.1081%        | 0.12%         |
| 84                  | 14-Nov-05     | 2026      | 93.9895% | 0.03%         | 93.9982%          | 0.9999    | -0.0087%       | -0.01%        |
| 85                  | 14-Nov-05     | 2347      | 93.9864% | 0.04%         | 93.9982%          | 0.9999    | -0.0118%       | -0.01%        |
| 86                  | 15-Nov-05     | 2740      | 93.8824% | 0.03%         | 93.9983%          | 0.9988    | -0.1159%       | -0.12%        |
| 87                  | 17-Nov-05     | 2347      | 93.9462% | 0.03%         | 93.9983%          | 0.9994    | -0.0521%       | -0.06%        |
| 88                  | 28-Nov-05     | 2026      | 93.9653% | 0.03%         | 93.9984%          | 0.9996    | -0.0331%       | -0.04%        |
| 89                  | 29-Nov-05     | 2740      | 93.9432% | 0.03%         | 93.9985%          | 0.9994    | -0.0553%       | -0.06%        |
| 90                  | 29-Nov-05     | 2347      | 94.0321% | 0.03%         | 93.9985%          | 1.0004    | 0.0336%        | 0.04%         |
| 91                  | 30-Nov-05     | 2347      | 93.9546% | 0.03%         | 93.9985%          | 0.9995    | -0.0439%       | -0.05%        |
| 92                  | 05-Dec-05     | 2026      | 93.9558% | 0.03%         | 93.9985%          | 0.9995    | -0.0427%       | -0.05%        |
| 93                  | 06-Dec-05     | 2740      | 94.0029% | 0.03%         | 93.9986%          | 1.0000    | 0.0043%        | 0.00%         |
| 94                  | 13-Dec-05     | 2026      | 93.9961% | 0.03%         | 93.9987%          | 1.0000    | -0.0026%       | 0.00%         |
| 95                  | 13-Dec-05     | 2740      | 93.9343% | 0.03%         | 93.9987%          | 0.9993    | -0.0644%       | -0.07%        |
| 96                  | 19-Dec-05     | 2026      | 93.9767% | 0.03%         | 93.9987%          | 0.9998    | -0.0220%       | -0.02%        |
| 97                  | 19-Dec-05     | 2740      | 93.9484% | 0.03%         | 93.9987%          | 0.9995    | -0.0503%       | -0.05%        |
| Mean:               |               |           |          |               |                   | 0.9998    | -0.0218%       | -0.02%        |
| Standard Deviation: |               |           |          |               |                   | 0.0005    | 0.0504%        | 0.05%         |
| Standard Error:     |               |           |          |               |                   | 0.0001    | 0.0051%        | 0.01%         |



**WEIGHT PERCENT 239-Pu DATA**  
**Calendar Year 2005**

**LLNL: Calex 1**

| #                   | Date Measured | Instr. ID | 239-Pu   | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|---------------------|---------------|-----------|----------|---------------|-------------------|-----------|----------------|---------------|
| 1                   | 03-Jan-05     | 3         | 94.0226% | 0.03%         | 93.9937%          | 1.0003    | 0.0289%        | 0.03%         |
| 2                   | 11-Jan-05     | 2         | 93.9857% | 0.02%         | 93.9938%          | 0.9999    | -0.0081%       | -0.01%        |
| 3                   | 18-Jan-05     | 3         | 94.0069% | 0.03%         | 93.9939%          | 1.0001    | 0.0130%        | 0.01%         |
| 4                   | 25-Jan-05     | 1         | 93.9968% | 0.02%         | 93.9940%          | 1.0000    | 0.0028%        | 0.00%         |
| 5                   | 26-Jan-05     | 2         | 94.0136% | 0.02%         | 93.9940%          | 1.0002    | 0.0196%        | 0.02%         |
| 6                   | 27-Jan-05     | 3         | 94.0092% | 0.03%         | 93.9940%          | 1.0002    | 0.0152%        | 0.02%         |
| 7                   | 08-Feb-05     | 2         | 93.9762% | 0.03%         | 93.9942%          | 0.9998    | -0.0180%       | -0.02%        |
| 8                   | 14-Feb-05     | 1         | 93.9780% | 0.02%         | 93.9943%          | 0.9998    | -0.0163%       | -0.02%        |
| 9                   | 24-Feb-05     | 3         | 94.0022% | 0.02%         | 93.9944%          | 1.0001    | 0.0078%        | 0.01%         |
| 10                  | 28-Feb-05     | 1         | 93.9992% | 0.02%         | 93.9945%          | 1.0000    | 0.0047%        | 0.00%         |
| 11                  | 10-Mar-05     | 2         | 93.9999% | 0.02%         | 93.9946%          | 1.0001    | 0.0053%        | 0.01%         |
| 12                  | 21-Mar-05     | 3         | 94.0178% | 0.03%         | 93.9948%          | 1.0002    | 0.0230%        | 0.02%         |
| 13                  | 12-Apr-05     | 1         | 93.9992% | 0.02%         | 93.9951%          | 1.0000    | 0.0041%        | 0.00%         |
| 14                  | 18-Apr-05     | 3         | 93.9909% | 0.03%         | 93.9952%          | 1.0000    | -0.0043%       | 0.00%         |
| 15                  | 09-May-05     | 3         | 93.9664% | 0.03%         | 93.9955%          | 0.9997    | -0.0291%       | -0.03%        |
| 16                  | 16-May-05     | 1         | 94.0132% | 0.02%         | 93.9956%          | 1.0002    | 0.0176%        | 0.02%         |
| 17                  | 16-May-05     | 1         | 94.0020% | 0.02%         | 93.9956%          | 1.0001    | 0.0064%        | 0.01%         |
| 18                  | 17-May-05     | 1         | 93.9860% | 0.02%         | 93.9956%          | 0.9999    | -0.0096%       | -0.01%        |
| 19                  | 17-May-05     | 1         | 94.0031% | 0.02%         | 93.9956%          | 1.0001    | 0.0075%        | 0.01%         |
| 20                  | 17-May-05     | 1         | 94.0056% | 0.02%         | 93.9956%          | 1.0001    | 0.0100%        | 0.01%         |
| 21                  | 17-May-05     | 1         | 94.0080% | 0.02%         | 93.9956%          | 1.0001    | 0.0124%        | 0.01%         |
| 22                  | 18-May-05     | 1         | 94.0042% | 0.02%         | 93.9957%          | 1.0001    | 0.0085%        | 0.01%         |
| 23                  | 18-May-05     | 1         | 94.0108% | 0.02%         | 93.9957%          | 1.0002    | 0.0151%        | 0.02%         |
| 24                  | 18-May-05     | 1         | 94.0190% | 0.02%         | 93.9957%          | 1.0002    | 0.0233%        | 0.02%         |
| 25                  | 25-May-05     | 3         | 93.9923% | 0.03%         | 93.9958%          | 1.0000    | -0.0035%       | 0.00%         |
| 26                  | 07-Jun-05     | 3         | 93.9932% | 0.03%         | 93.9959%          | 1.0000    | -0.0027%       | 0.00%         |
| 27                  | 16-Jun-05     | 1         | 93.9944% | 0.03%         | 93.9961%          | 1.0000    | -0.0017%       | 0.00%         |
| 28                  | 22-Jun-05     | 3         | 93.9815% | 0.03%         | 93.9962%          | 0.9998    | -0.0147%       | -0.02%        |
| 29                  | 27-Jun-05     | 3         | 93.9686% | 0.03%         | 93.9962%          | 0.9997    | -0.0276%       | -0.03%        |
| 30                  | 28-Jun-05     | 1         | 94.0112% | 0.03%         | 93.9962%          | 1.0002    | 0.0150%        | 0.02%         |
| 31                  | 01-Jul-05     | 1         | 94.0065% | 0.03%         | 93.9963%          | 1.0001    | 0.0102%        | 0.01%         |
| 32                  | 14-Jul-05     | 1         | 94.0024% | 0.03%         | 93.9965%          | 1.0001    | 0.0059%        | 0.01%         |
| 33                  | 20-Jul-05     | 3         | 93.9732% | 0.03%         | 93.9966%          | 0.9998    | -0.0234%       | -0.02%        |
| 34                  | 25-Jul-05     | 1         | 93.9963% | 0.03%         | 93.9966%          | 1.0000    | -0.0003%       | 0.00%         |
| 35                  | 26-Jul-05     | 3         | 93.9844% | 0.03%         | 93.9967%          | 0.9999    | -0.0123%       | -0.01%        |
| 36                  | 15-Aug-05     | 3         | 93.9927% | 0.03%         | 93.9969%          | 1.0000    | -0.0042%       | 0.00%         |
| 37                  | 23-Aug-05     | 1         | 94.0051% | 0.03%         | 93.9971%          | 1.0001    | 0.0080%        | 0.01%         |
| 38                  | 26-Aug-05     | 1         | 93.9980% | 0.03%         | 93.9971%          | 1.0000    | 0.0009%        | 0.00%         |
| 39                  | 13-Sep-05     | 1         | 94.0255% | 0.03%         | 93.9974%          | 1.0003    | 0.0281%        | 0.03%         |
| 40                  | 19-Sep-05     | 3         | 93.9614% | 0.03%         | 93.9974%          | 0.9996    | -0.0360%       | -0.04%        |
| 41                  | 22-Sep-05     | 2         | 94.0223% | 0.03%         | 93.9975%          | 1.0003    | 0.0248%        | 0.03%         |
| 42                  | 23-Sep-05     | 2         | 93.9893% | 0.03%         | 93.9975%          | 0.9999    | -0.0082%       | -0.01%        |
| 43                  | 06-Oct-05     | 3         | 94.0094% | 0.03%         | 93.9977%          | 1.0001    | 0.0117%        | 0.01%         |
| 44                  | 11-Oct-05     | 3         | 93.9550% | 0.03%         | 93.9978%          | 0.9995    | -0.0428%       | -0.05%        |
| 45                  | 15-Nov-05     | 1         | 94.0430% | 0.03%         | 93.9983%          | 1.0005    | 0.0447%        | 0.05%         |
| 46                  | 29-Nov-05     | 2         | 93.9770% | 0.03%         | 93.9985%          | 0.9998    | -0.0215%       | -0.02%        |
| 47                  | 07-Dec-05     | 2         | 93.9764% | 0.03%         | 93.9986%          | 0.9998    | -0.0222%       | -0.02%        |
| 48                  | 20-Dec-05     | 2         | 94.0352% | 0.03%         | 93.9988%          | 1.0004    | 0.0364%        | 0.04%         |
| Mean:               |               |           |          |               |                   | 1.0000    | 0.0022%        | 0.00%         |
| Standard Deviation: |               |           |          |               |                   | 0.0002    | 0.0186%        | 0.02%         |
| Standard Error:     |               |           |          |               |                   | 0.0000    | 0.0027%        | 0.00%         |



L: <sup>240</sup>Pu ISOTOPE ABUNDANCE TABLES AND GRAPHS



**RESULTS OF ANALYSIS OF Pu-240 DATA  
1st QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0332% | -0.0060% |
| Standard deviation (weight %)    | 0.0510% | 0.0140%  |
| certainty in the Mean (weight %) | 0.0093% | 0.0040%  |
| Mean Error (%)                   | 0.57%   | -0.10%   |
| Standard Deviation (%)           | 0.87%   | 0.25%    |
| Uncertainty in the Mean (%)      | 0.16%   | 0.07%    |
| Number of Data Points            | 30      | 12       |
| Number of Outliers               | 0       | 0        |

**Difference from Last Quarter in:**

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | -0.0016% | 0.0009%  |
| Standard deviation (weight %)    | 0.0150%  | -0.0087% |
| certainty in the Mean (weight %) | 0.0022%  | -0.0025% |
| Mean Error (%)                   | -0.02%   | 0.02%    |
| Standard Deviation (%)           | 0.26%    | -0.14%   |
| Uncertainty in the Mean (%)      | 0.04%    | -0.04%   |
| Number of Data Points            | 4        | 0        |
| Number of Outliers               | 0        | 0        |

**RESULTS OF ANALYSIS OF Pu-240 DATA  
2nd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0295% | -0.0080% |
| Standard deviation (weight %)    | 0.0506% | 0.0294%  |
| certainty in the Mean (weight %) | 0.0116% | 0.0069%  |
| Mean Error (%)                   | 0.50%   | -0.14%   |
| Standard Deviation (%)           | 0.86%   | 0.50%    |
| Uncertainty in the Mean (%)      | 0.20%   | 0.12%    |
| Number of Data Points            | 19      | 18       |
| Number of Outliers               | 0       | 0        |

**Difference from Last Quarter in:**

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | -0.0037% | -0.0020% |
| Standard deviation (weight %)    | -0.0004% | 0.0154%  |
| certainty in the Mean (weight %) | 0.0023%  | 0.0029%  |
| Mean Error (%)                   | -0.07%   | -0.04%   |
| Standard Deviation (%)           | -0.01%   | 0.25%    |
| Uncertainty in the Mean (%)      | 0.04%    | 0.05%    |
| Number of Data Points            | -11      | 6        |
| Number of Outliers               | 0        | 0        |

**RESULTS OF ANALYSIS OF Pu-240 DATA**  
**3rd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                                  |         |         |
|----------------------------------|---------|---------|
| Mean error (weight %)            | 0.0184% | 0.0009% |
| Standard deviation (weight %)    | 0.0530% | 0.0183% |
| certainty in the Mean (weight %) | 0.0116% | 0.0053% |
| Mean Error (%)                   | 0.31%   | 0.02%   |
| Standard Deviation (%)           | 0.90%   | 0.31%   |
| Uncertainty in the Mean (%)      | 0.20%   | 0.09%   |
| Number of Data Points            | 21      | 12      |
| Number of Outliers               | 0       | 0       |

**Difference from Last Quarter in:**

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | -0.0111% | 0.0089%  |
| Standard deviation (weight %)    | 0.0024%  | -0.0111% |
| certainty in the Mean (weight %) | 0.0000%  | -0.0016% |
| Mean Error (%)                   | -0.19%   | 0.16%    |
| Standard Deviation (%)           | 0.04%    | -0.19%   |
| Uncertainty in the Mean (%)      | 0.00%    | -0.03%   |
| Number of Data Points            | 2        | -6       |
| Number of Outliers               | 0        | 0        |

**RESULTS OF ANALYSIS OF Pu-240 DATA  
4th QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

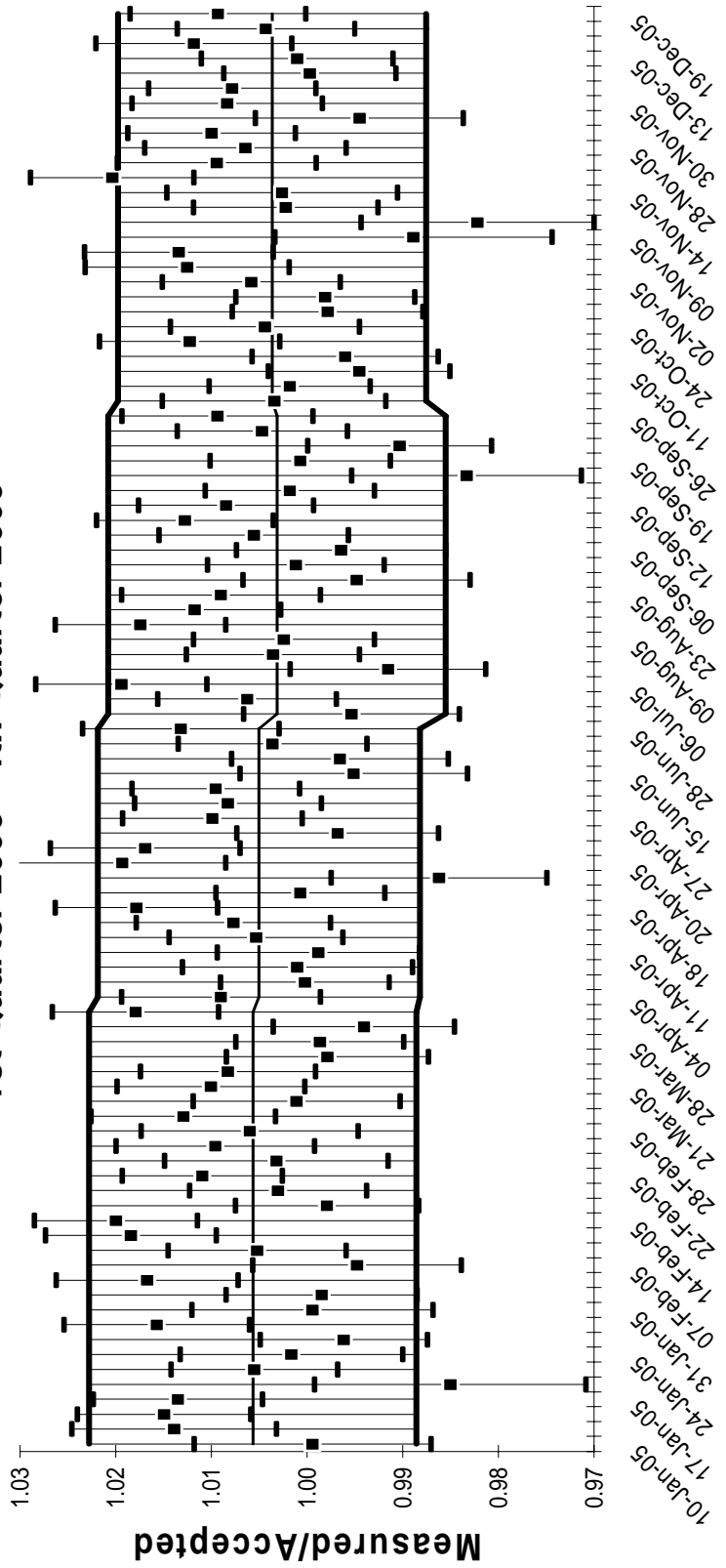
|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0214% | -0.0007% |
| Standard deviation (weight %)    | 0.0481% | 0.0357%  |
| certainty in the Mean (weight %) | 0.0093% | 0.0146%  |
| Mean Error (%)                   | 0.37%   | -0.01%   |
| Standard Deviation (%)           | 0.82%   | 0.61%    |
| Uncertainty in the Mean (%)      | 0.16%   | 0.25%    |
| Number of Data Points            | 27      | 6        |
| Number of Outliers               | 0       | 0        |

**Difference from Last Quarter in:**

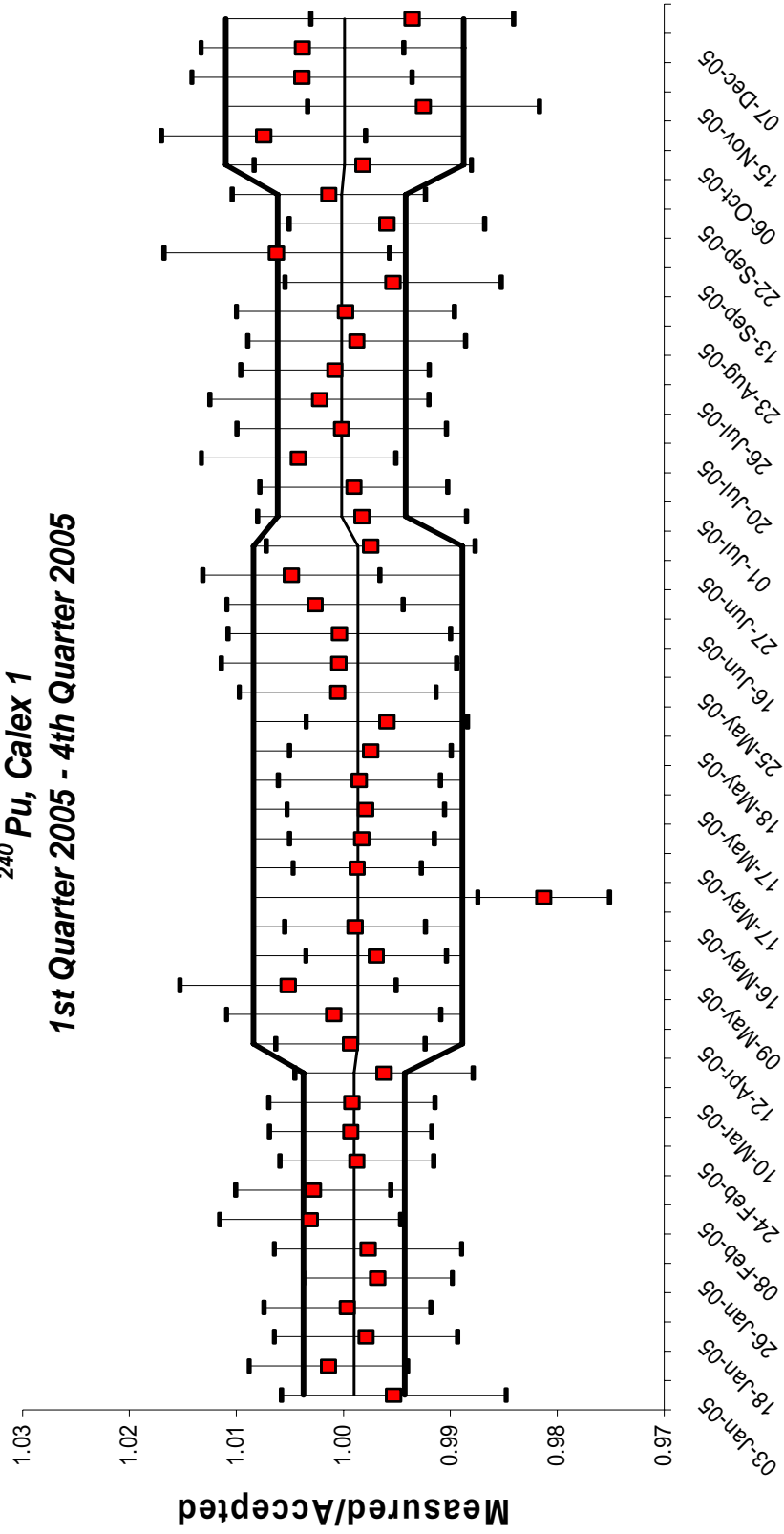
|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | 0.0030%  | -0.0016% |
| Standard deviation (weight %)    | -0.0049% | 0.0174%  |
| certainty in the Mean (weight %) | -0.0023% | 0.0093%  |
| Mean Error (%)                   | 0.06%    | -0.03%   |
| Standard Deviation (%)           | -0.08%   | 0.30%    |
| Uncertainty in the Mean (%)      | -0.04%   | 0.16%    |
| Number of Data Points            | 6        | -6       |
| Number of Outliers               | 0        | 0        |



**HANFORD**  
**<sup>240</sup>Pu, Calex 1**  
**1st Quarter 2005 - 4th Quarter 2005**



**LAWRENCE LIVERMORE**  
**<sup>240</sup>Pu, Calex 1**  
**1st Quarter 2005 - 4th Quarter 2005**



**RESULTS OF ANALYSIS OF Pu-240 DATA  
2005**

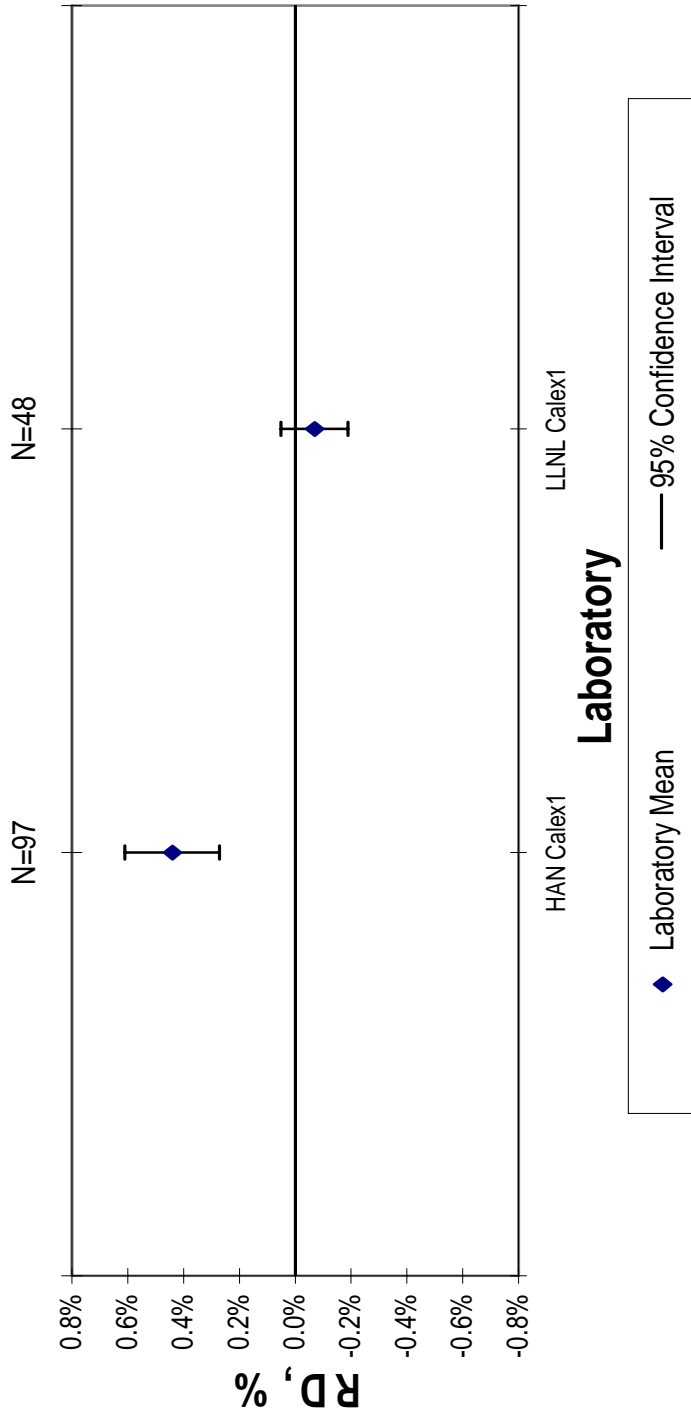
Hanford Calex 1 LLNL Calex 1

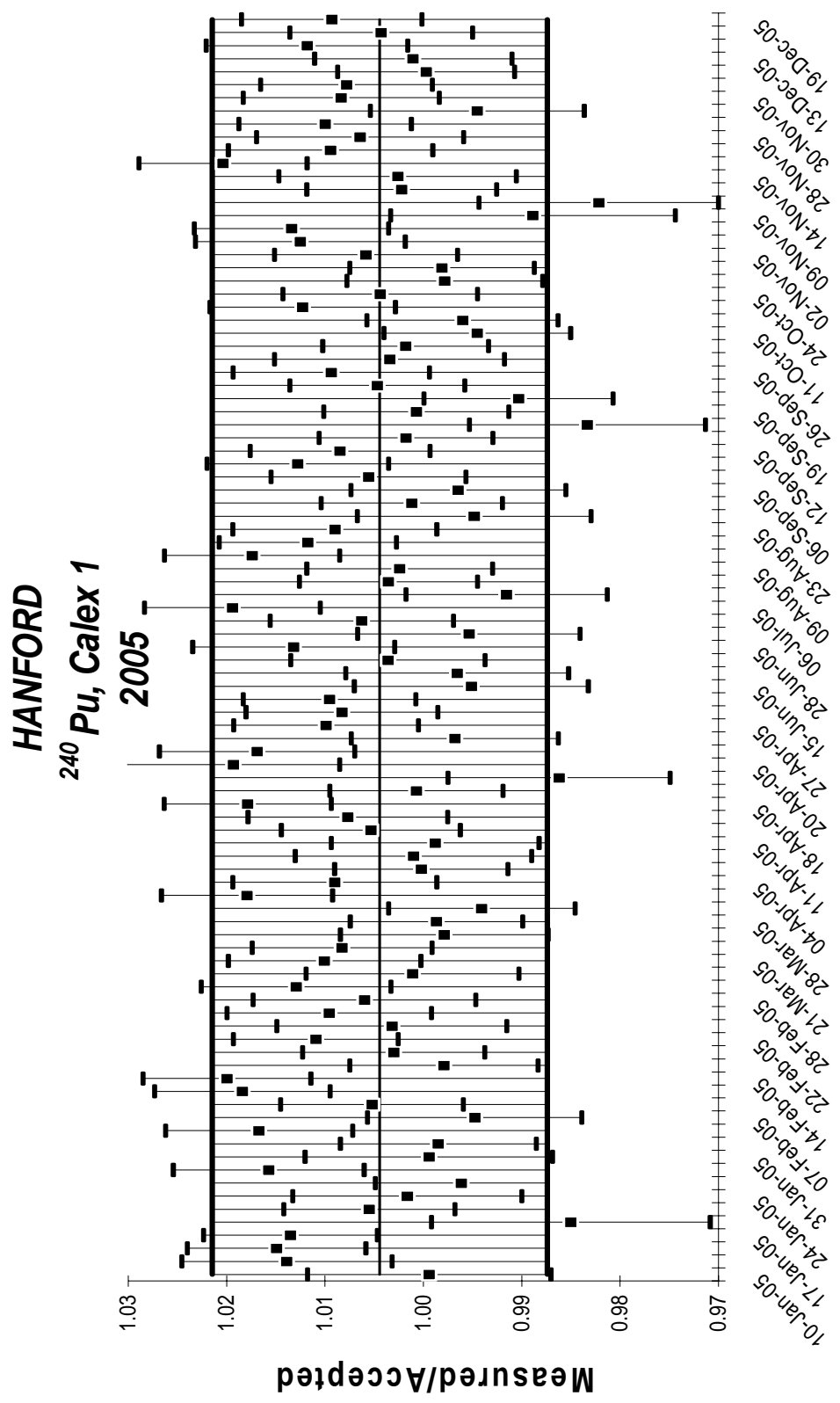
|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0260% | -0.0044% |
| Standard deviation (weight %)    | 0.0501% | 0.0243%  |
| certainty in the Mean (weight %) | 0.0051% | 0.0035%  |
| Mean Error (%)                   | 0.44%   | -0.07%   |
| Standard Deviation (%)           | 0.86%   | 0.41%    |
| Uncertainty in the Mean (%)      | 0.09%   | 0.06%    |
| Number of Data Points            | 97      | 48       |
| Number of Outliers               | 0       | 0        |

**Difference from Last Year in:**

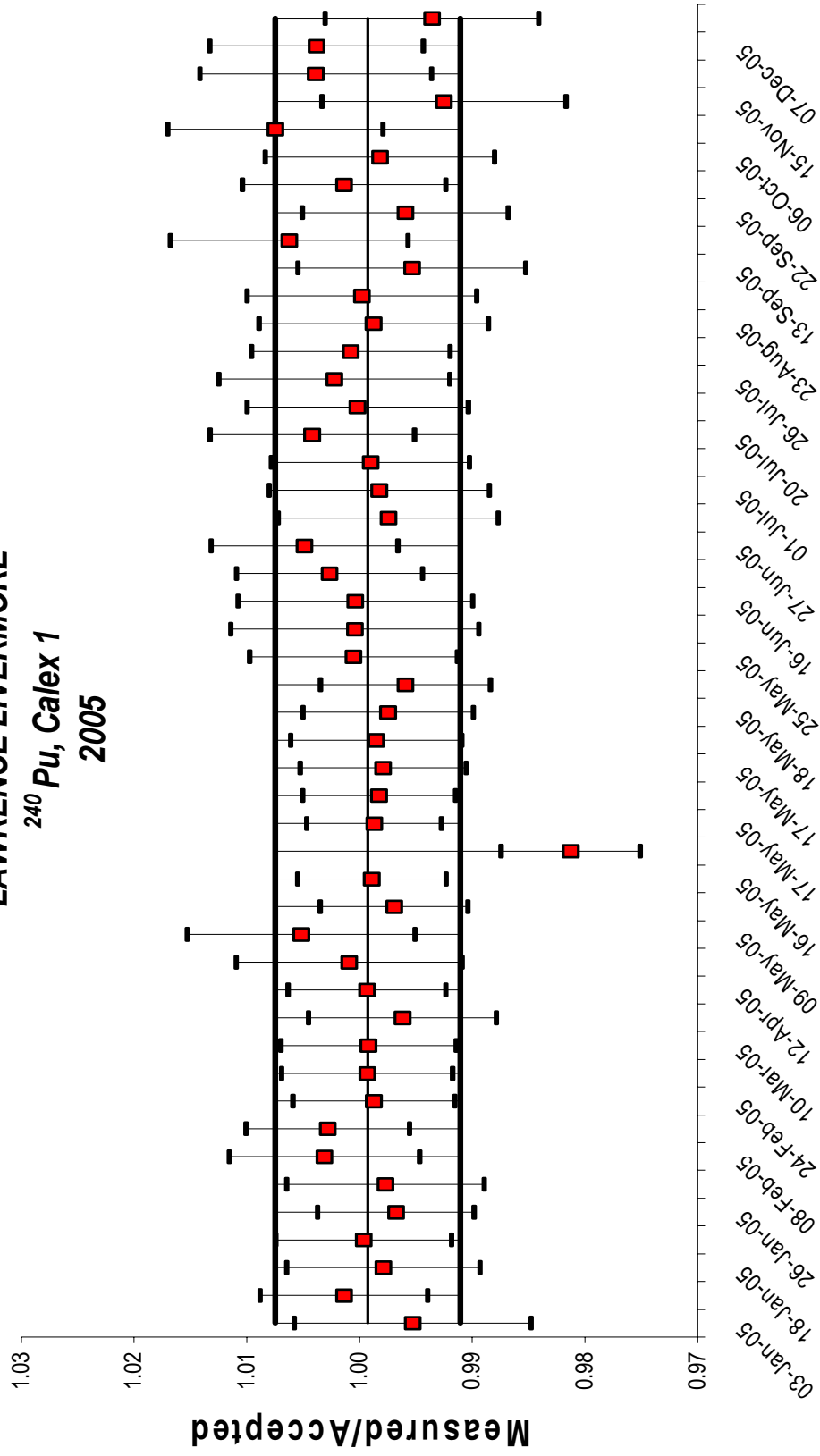
|                                  |          |         |
|----------------------------------|----------|---------|
| Mean error (weight %)            | -0.0078% | 0.0045% |
| Standard deviation (weight %)    | 0.0112%  | 0.0006% |
| certainty in the Mean (weight %) | 0.0019%  | 0.0008% |
| Mean Error (%)                   | -0.14%   | 0.08%   |
| Standard Deviation (%)           | 0.20%    | 0.01%   |
| Uncertainty in the Mean (%)      | 0.04%    | 0.01%   |
| Number of Data Points            | -50      | -28     |
| Number of Outliers               | -1       | 0       |

# New Brunswick Laboratory Calorimetry Exchange Program Percent <sup>240</sup>Pu, 2005





LAWRENCE LIVERMORE  
<sup>240</sup>Pu, Calex 1  
2005



**WEIGHT PERCENT 240-Pu DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #  | Date Measured | Instr. ID | 240-Pu  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|----|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|
| 1  | 10-Jan-05     | 2424      | 5.8572% | 0.62%         | 5.8607%           | 0.9994    | -0.0035%       | -0.06%        |
| 2  | 10-Jan-05     | 2026      | 5.9420% | 0.52%         | 5.8607%           | 1.0139    | 0.0813%        | 1.39%         |
| 3  | 11-Jan-05     | 2740      | 5.9481% | 0.44%         | 5.8607%           | 1.0149    | 0.0874%        | 1.49%         |
| 4  | 17-Jan-05     | 2740      | 5.9398% | 0.43%         | 5.8607%           | 1.0135    | 0.0791%        | 1.35%         |
| 5  | 18-Jan-05     | 2424      | 5.7728% | 0.73%         | 5.8607%           | 0.9850    | -0.0879%       | -1.50%        |
| 6  | 18-Jan-05     | 2026      | 5.8929% | 0.43%         | 5.8607%           | 1.0055    | 0.0322%        | 0.55%         |
| 7  | 24-Jan-05     | 2424      | 5.8702% | 0.58%         | 5.8607%           | 1.0016    | 0.0095%        | 0.16%         |
| 8  | 25-Jan-05     | 2026      | 5.8381% | 0.44%         | 5.8607%           | 0.9961    | -0.0226%       | -0.39%        |
| 9  | 26-Jan-05     | 2740      | 5.9527% | 0.47%         | 5.8607%           | 1.0157    | 0.0920%        | 1.57%         |
| 10 | 31-Jan-05     | 2424      | 5.8573% | 0.63%         | 5.8607%           | 0.9994    | -0.0034%       | -0.06%        |
| 11 | 31-Jan-05     | 2026      | 5.8517% | 0.50%         | 5.8607%           | 0.9985    | -0.0090%       | -0.15%        |
| 12 | 01-Feb-05     | 2740      | 5.9586% | 0.46%         | 5.8607%           | 1.0167    | 0.0979%        | 1.67%         |
| 13 | 07-Feb-05     | 2424      | 5.8300% | 0.55%         | 5.8607%           | 0.9948    | -0.0307%       | -0.52%        |
| 14 | 07-Feb-05     | 2026      | 5.8912% | 0.46%         | 5.8607%           | 1.0052    | 0.0305%        | 0.52%         |
| 15 | 08-Feb-05     | 2740      | 5.9685% | 0.43%         | 5.8607%           | 1.0184    | 0.1078%        | 1.84%         |
| 16 | 14-Feb-05     | 2740      | 5.9776% | 0.41%         | 5.8607%           | 1.0199    | 0.1169%        | 1.99%         |
| 17 | 16-Feb-05     | 2424      | 5.8484% | 0.48%         | 5.8607%           | 0.9979    | -0.0123%       | -0.21%        |
| 18 | 17-Feb-05     | 2026      | 5.8783% | 0.46%         | 5.8607%           | 1.0030    | 0.0176%        | 0.30%         |
| 19 | 22-Feb-05     | 2740      | 5.9247% | 0.41%         | 5.8607%           | 1.0109    | 0.0640%        | 1.09%         |
| 20 | 23-Feb-05     | 2424      | 5.8794% | 0.58%         | 5.8607%           | 1.0032    | 0.0187%        | 0.32%         |
| 21 | 23-Feb-05     | 2026      | 5.9168% | 0.51%         | 5.8607%           | 1.0096    | 0.0561%        | 0.96%         |
| 22 | 28-Feb-05     | 2424      | 5.8957% | 0.56%         | 5.8607%           | 1.0060    | 0.0350%        | 0.60%         |
| 23 | 14-Mar-05     | 2740      | 5.9364% | 0.47%         | 5.8607%           | 1.0129    | 0.0757%        | 1.29%         |
| 24 | 15-Mar-05     | 2424      | 5.8670% | 0.54%         | 5.8607%           | 1.0011    | 0.0063%        | 0.11%         |
| 25 | 21-Mar-05     | 2026      | 5.9195% | 0.48%         | 5.8607%           | 1.0100    | 0.0588%        | 1.00%         |
| 26 | 21-Mar-05     | 2740      | 5.9090% | 0.45%         | 5.8607%           | 1.0082    | 0.0483%        | 0.82%         |
| 27 | 22-Mar-05     | 2424      | 5.8481% | 0.53%         | 5.8607%           | 0.9979    | -0.0126%       | -0.21%        |
| 28 | 28-Mar-05     | 2026      | 5.8528% | 0.44%         | 5.8607%           | 0.9987    | -0.0079%       | -0.13%        |
| 29 | 29-Mar-05     | 2424      | 5.8258% | 0.48%         | 5.8607%           | 0.9940    | -0.0349%       | -0.60%        |
| 30 | 29-Mar-05     | 2740      | 5.9657% | 0.42%         | 5.8607%           | 1.0179    | 0.1050%        | 1.79%         |
| 31 | 04-Apr-05     | 2026      | 5.9134% | 0.51%         | 5.8607%           | 1.0090    | 0.0527%        | 0.90%         |
| 32 | 04-Apr-05     | 2740      | 5.8619% | 0.44%         | 5.8607%           | 1.0002    | 0.0012%        | 0.02%         |
| 33 | 05-Apr-05     | 2424      | 5.8665% | 0.60%         | 5.8607%           | 1.0010    | 0.0058%        | 0.10%         |
| 34 | 11-Apr-05     | 2026      | 5.8536% | 0.53%         | 5.8607%           | 0.9988    | -0.0071%       | -0.12%        |
| 35 | 12-Apr-05     | 2740      | 5.8919% | 0.45%         | 5.8607%           | 1.0053    | 0.0312%        | 0.53%         |
| 36 | 13-Apr-05     | 2424      | 5.9056% | 0.50%         | 5.8607%           | 1.0077    | 0.0449%        | 0.77%         |
| 37 | 18-Apr-05     | 2740      | 5.9652% | 0.41%         | 5.8607%           | 1.0178    | 0.1045%        | 1.78%         |
| 38 | 19-Apr-05     | 2026      | 5.8647% | 0.44%         | 5.8607%           | 1.0007    | 0.0040%        | 0.07%         |
| 39 | 19-Apr-05     | 2424      | 5.7798% | 0.58%         | 5.8607%           | 0.9862    | -0.0809%       | -1.38%        |
| 40 | 20-Apr-05     | 2424      | 5.9737% | 0.52%         | 5.8607%           | 1.0193    | 0.1130%        | 1.93%         |
| 41 | 25-Apr-05     | 2740      | 5.9597% | 0.48%         | 5.8607%           | 1.0169    | 0.0990%        | 1.69%         |
| 42 | 26-Apr-05     | 2424      | 5.8418% | 0.53%         | 5.8607%           | 0.9968    | -0.0189%       | -0.32%        |
| 43 | 27-Apr-05     | 2026      | 5.9185% | 0.46%         | 5.8607%           | 1.0099    | 0.0578%        | 0.99%         |
| 44 | 13-Jun-05     | 2026      | 5.9091% | 0.48%         | 5.8607%           | 1.0083    | 0.0484%        | 0.83%         |
| 45 | 14-Jun-05     | 2740      | 5.9165% | 0.43%         | 5.8607%           | 1.0095    | 0.0558%        | 0.95%         |
| 46 | 15-Jun-05     | 2424      | 5.8320% | 0.60%         | 5.8607%           | 0.9951    | -0.0287%       | -0.49%        |
| 47 | 27-Jun-05     | 2424      | 5.8405% | 0.57%         | 5.8606%           | 0.9966    | -0.0201%       | -0.34%        |
| 48 | 28-Jun-05     | 2026      | 5.8817% | 0.49%         | 5.8606%           | 1.0036    | 0.0211%        | 0.36%         |
| 49 | 28-Jun-05     | 2740      | 5.9379% | 0.50%         | 5.8606%           | 1.0132    | 0.0773%        | 1.32%         |
| 50 | 05-Jul-05     | 2424      | 5.8334% | 0.57%         | 5.8606%           | 0.9954    | -0.0272%       | -0.46%        |

**WEIGHT PERCENT 240-Pu DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #                   | Date Measured | Instr. ID | 240-Pu  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|---------------------|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|
| 51                  | 06-Jul-05     | 2026      | 5.8973% | 0.46%         | 5.8606%           | 1.0063    | 0.0367%        | 0.63%         |
| 52                  | 06-Jul-05     | 2740      | 5.9743% | 0.43%         | 5.8606%           | 1.0194    | 0.1137%        | 1.94%         |
| 53                  | 25-Jul-05     | 2424      | 5.8110% | 0.52%         | 5.8606%           | 0.9915    | -0.0496%       | -0.85%        |
| 54                  | 26-Jul-05     | 2026      | 5.8814% | 0.45%         | 5.8606%           | 1.0035    | 0.0208%        | 0.35%         |
| 55                  | 09-Aug-05     | 2026      | 5.8747% | 0.47%         | 5.8606%           | 1.0024    | 0.0141%        | 0.24%         |
| 56                  | 10-Aug-05     | 2740      | 5.9626% | 0.43%         | 5.8606%           | 1.0174    | 0.1020%        | 1.74%         |
| 57                  | 22-Aug-05     | 2740      | 5.9295% | 0.44%         | 5.8606%           | 1.0118    | 0.0689%        | 1.18%         |
| 58                  | 23-Aug-05     | 2026      | 5.9133% | 0.51%         | 5.8606%           | 1.0090    | 0.0527%        | 0.90%         |
| 59                  | 29-Aug-05     | 2424      | 5.8302% | 0.60%         | 5.8606%           | 0.9948    | -0.0304%       | -0.52%        |
| 60                  | 30-Aug-05     | 2026      | 5.8675% | 0.46%         | 5.8606%           | 1.0012    | 0.0069%        | 0.12%         |
| 61                  | 06-Sep-05     | 2424      | 5.8397% | 0.55%         | 5.8606%           | 0.9964    | -0.0209%       | -0.36%        |
| 62                  | 06-Sep-05     | 2026      | 5.8932% | 0.49%         | 5.8606%           | 1.0056    | 0.0326%        | 0.56%         |
| 63                  | 07-Sep-05     | 2740      | 5.9354% | 0.45%         | 5.8606%           | 1.0128    | 0.0748%        | 1.28%         |
| 64                  | 12-Sep-05     | 2740      | 5.9102% | 0.45%         | 5.8606%           | 1.0085    | 0.0496%        | 0.85%         |
| 65                  | 13-Sep-05     | 2026      | 5.8710% | 0.44%         | 5.8606%           | 1.0018    | 0.0104%        | 0.18%         |
| 66                  | 19-Sep-05     | 2424      | 5.7628% | 0.62%         | 5.8606%           | 0.9833    | -0.0978%       | -1.67%        |
| 67                  | 19-Sep-05     | 2026      | 5.8647% | 0.47%         | 5.8606%           | 1.0007    | 0.0041%        | 0.07%         |
| 68                  | 20-Sep-05     | 2740      | 5.8038% | 0.49%         | 5.8606%           | 0.9903    | -0.0568%       | -0.97%        |
| 69                  | 26-Sep-05     | 2740      | 5.8880% | 0.44%         | 5.8606%           | 1.0047    | 0.0274%        | 0.47%         |
| 70                  | 26-Sep-05     | 2026      | 5.9154% | 0.49%         | 5.8606%           | 1.0093    | 0.0548%        | 0.93%         |
| 71                  | 03-Oct-05     | 2424      | 5.8807% | 0.58%         | 5.8606%           | 1.0034    | 0.0201%        | 0.34%         |
| 72                  | 10-Oct-05     | 2740      | 5.8711% | 0.42%         | 5.8606%           | 1.0018    | 0.0105%        | 0.18%         |
| 73                  | 11-Oct-05     | 2026      | 5.8285% | 0.48%         | 5.8606%           | 0.9945    | -0.0321%       | -0.55%        |
| 74                  | 17-Oct-05     | 2026      | 5.8372% | 0.49%         | 5.8606%           | 0.9960    | -0.0234%       | -0.40%        |
| 75                  | 17-Oct-05     | 2740      | 5.9324% | 0.46%         | 5.8606%           | 1.0122    | 0.0718%        | 1.22%         |
| 76                  | 24-Oct-05     | 2740      | 5.8862% | 0.49%         | 5.8606%           | 1.0044    | 0.0256%        | 0.44%         |
| 77                  | 31-Oct-05     | 2740      | 5.8478% | 0.50%         | 5.8606%           | 0.9978    | -0.0128%       | -0.22%        |
| 78                  | 01-Nov-05     | 2026      | 5.8494% | 0.47%         | 5.8606%           | 0.9981    | -0.0112%       | -0.19%        |
| 79                  | 02-Nov-05     | 2740      | 5.8947% | 0.46%         | 5.8606%           | 1.0058    | 0.0341%        | 0.58%         |
| 80                  | 07-Nov-05     | 2026      | 5.9339% | 0.52%         | 5.8606%           | 1.0125    | 0.0733%        | 1.25%         |
| 81                  | 08-Nov-05     | 2740      | 5.9391% | 0.48%         | 5.8606%           | 1.0134    | 0.0785%        | 1.34%         |
| 82                  | 09-Nov-05     | 2347      | 5.7953% | 0.74%         | 5.8606%           | 0.9889    | -0.0653%       | -1.11%        |
| 83                  | 11-Nov-05     | 2347      | 5.7561% | 0.63%         | 5.8606%           | 0.9822    | -0.1045%       | -1.78%        |
| 84                  | 14-Nov-05     | 2026      | 5.8735% | 0.48%         | 5.8606%           | 1.0022    | 0.0129%        | 0.22%         |
| 85                  | 14-Nov-05     | 2347      | 5.8758% | 0.60%         | 5.8606%           | 1.0026    | 0.0152%        | 0.26%         |
| 86                  | 15-Nov-05     | 2740      | 5.9799% | 0.41%         | 5.8606%           | 1.0204    | 0.1193%        | 2.04%         |
| 87                  | 17-Nov-05     | 2347      | 5.9158% | 0.51%         | 5.8606%           | 1.0094    | 0.0552%        | 0.94%         |
| 88                  | 28-Nov-05     | 2026      | 5.8982% | 0.52%         | 5.8606%           | 1.0064    | 0.0376%        | 0.64%         |
| 89                  | 29-Nov-05     | 2740      | 5.9190% | 0.43%         | 5.8606%           | 1.0100    | 0.0584%        | 1.00%         |
| 90                  | 29-Nov-05     | 2347      | 5.8284% | 0.55%         | 5.8606%           | 0.9945    | -0.0322%       | -0.55%        |
| 91                  | 30-Nov-05     | 2347      | 5.9095% | 0.49%         | 5.8606%           | 1.0083    | 0.0489%        | 0.83%         |
| 92                  | 05-Dec-05     | 2026      | 5.9064% | 0.43%         | 5.8606%           | 1.0078    | 0.0458%        | 0.78%         |
| 93                  | 06-Dec-05     | 2740      | 5.8588% | 0.45%         | 5.8606%           | 0.9997    | -0.0018%       | -0.03%        |
| 94                  | 13-Dec-05     | 2026      | 5.8666% | 0.50%         | 5.8606%           | 1.0010    | 0.0060%        | 0.10%         |
| 95                  | 13-Dec-05     | 2740      | 5.9298% | 0.50%         | 5.8606%           | 1.0118    | 0.0692%        | 1.18%         |
| 96                  | 19-Dec-05     | 2026      | 5.8857% | 0.46%         | 5.8606%           | 1.0043    | 0.0251%        | 0.43%         |
| 97                  | 19-Dec-05     | 2740      | 5.9151% | 0.45%         | 5.8606%           | 1.0093    | 0.0545%        | 0.93%         |
| Mean:               |               |           |         |               |                   | 1.0044    | 0.0260%        | 0.44%         |
| Standard Deviation: |               |           |         |               |                   | 0.0086    | 0.0501%        | 0.86%         |
| Standard Error:     |               |           |         |               |                   | 0.0009    | 0.0051%        | 0.09%         |



**WEIGHT PERCENT 240-Pu DATA**  
**Calendar Year 2005**

**LLNL: Calex 1**

| #                   | Date Measured | Instr. ID | 240-Pu  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |        |
|---------------------|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|--------|
| 1                   | 03-Jan-05     | 3         | 5.8330% | 0.53%         | 5.8607%           | 0.9953    | -0.0277%       | -0.47%        |        |
| 2                   | 11-Jan-05     | 2         | 5.8687% | 0.37%         | 5.8607%           | 1.0014    | 0.0080%        | 0.14%         |        |
| 3                   | 18-Jan-05     | 3         | 5.8482% | 0.43%         | 5.8607%           | 0.9979    | -0.0125%       | -0.21%        |        |
| 4                   | 25-Jan-05     | 1         | 5.8584% | 0.39%         | 5.8607%           | 0.9996    | -0.0023%       | -0.04%        |        |
| 5                   | 26-Jan-05     | 2         | 5.8417% | 0.35%         | 5.8607%           | 0.9968    | -0.0190%       | -0.32%        |        |
| 6                   | 27-Jan-05     | 3         | 5.8471% | 0.44%         | 5.8607%           | 0.9977    | -0.0136%       | -0.23%        |        |
| 7                   | 08-Feb-05     | 2         | 5.8788% | 0.42%         | 5.8607%           | 1.0031    | 0.0181%        | 0.31%         |        |
| 8                   | 14-Feb-05     | 1         | 5.8771% | 0.36%         | 5.8607%           | 1.0028    | 0.0164%        | 0.28%         |        |
| 9                   | 24-Feb-05     | 3         | 5.8532% | 0.36%         | 5.8607%           | 0.9987    | -0.0075%       | -0.13%        |        |
| 10                  | 28-Feb-05     | 1         | 5.8566% | 0.38%         | 5.8607%           | 0.9993    | -0.0041%       | -0.07%        |        |
| 11                  | 10-Mar-05     | 2         | 5.8559% | 0.39%         | 5.8607%           | 0.9992    | -0.0048%       | -0.08%        |        |
| 12                  | 21-Mar-05     | 3         | 5.8383% | 0.42%         | 5.8607%           | 0.9962    | -0.0224%       | -0.38%        |        |
| 13                  | 12-Apr-05     | 1         | 5.8567% | 0.35%         | 5.8607%           | 0.9993    | -0.0040%       | -0.07%        |        |
| 14                  | 18-Apr-05     | 3         | 5.8659% | 0.50%         | 5.8607%           | 1.0009    | 0.0052%        | 0.09%         |        |
| 15                  | 09-May-05     | 3         | 5.8909% | 0.50%         | 5.8607%           | 1.0052    | 0.0302%        | 0.52%         |        |
| 16                  | 16-May-05     | 1         | 5.8426% | 0.33%         | 5.8607%           | 0.9969    | -0.0181%       | -0.31%        |        |
| 17                  | 16-May-05     | 1         | 5.8542% | 0.33%         | 5.8607%           | 0.9989    | -0.0065%       | -0.11%        |        |
| 18                  | 17-May-05     | 1         | 5.7508% | 0.32%         | 5.8607%           | 0.9813    | -0.1099%       | -1.87%        |        |
| 19                  | 17-May-05     | 1         | 5.8530% | 0.30%         | 5.8607%           | 0.9987    | -0.0077%       | -0.13%        |        |
| 20                  | 17-May-05     | 1         | 5.8504% | 0.34%         | 5.8607%           | 0.9982    | -0.0103%       | -0.18%        |        |
| 21                  | 17-May-05     | 1         | 5.8483% | 0.37%         | 5.8607%           | 0.9979    | -0.0124%       | -0.21%        |        |
| 22                  | 18-May-05     | 1         | 5.8519% | 0.38%         | 5.8607%           | 0.9985    | -0.0088%       | -0.15%        |        |
| 23                  | 18-May-05     | 1         | 5.8457% | 0.38%         | 5.8607%           | 0.9974    | -0.0150%       | -0.26%        |        |
| 24                  | 18-May-05     | 1         | 5.8367% | 0.38%         | 5.8607%           | 0.9959    | -0.0240%       | -0.41%        |        |
| 25                  | 25-May-05     | 3         | 5.8637% | 0.46%         | 5.8607%           | 1.0005    | 0.0030%        | 0.05%         |        |
| 26                  | 07-Jun-05     | 3         | 5.8630% | 0.55%         | 5.8607%           | 1.0004    | 0.0023%        | 0.04%         |        |
| 27                  | 16-Jun-05     | 1         | 5.8627% | 0.52%         | 5.8607%           | 1.0003    | 0.0021%        | 0.03%         |        |
| 28                  | 22-Jun-05     | 3         | 5.8761% | 0.41%         | 5.8606%           | 1.0026    | 0.0155%        | 0.26%         |        |
| 29                  | 27-Jun-05     | 3         | 5.8891% | 0.41%         | 5.8606%           | 1.0049    | 0.0285%        | 0.49%         |        |
| 30                  | 28-Jun-05     | 1         | 5.8456% | 0.49%         | 5.8606%           | 0.9974    | -0.0150%       | -0.26%        |        |
| 31                  | 01-Jul-05     | 1         | 5.8502% | 0.49%         | 5.8606%           | 0.9982    | -0.0104%       | -0.18%        |        |
| 32                  | 14-Jul-05     | 1         | 5.8548% | 0.44%         | 5.8606%           | 0.9990    | -0.0058%       | -0.10%        |        |
| 33                  | 20-Jul-05     | 3         | 5.8851% | 0.45%         | 5.8606%           | 1.0042    | 0.0245%        | 0.42%         |        |
| 34                  | 25-Jul-05     | 1         | 5.8615% | 0.49%         | 5.8606%           | 1.0001    | 0.0009%        | 0.01%         |        |
| 35                  | 26-Jul-05     | 3         | 5.8736% | 0.51%         | 5.8606%           | 1.0022    | 0.0130%        | 0.22%         |        |
| 36                  | 15-Aug-05     | 3         | 5.8651% | 0.44%         | 5.8606%           | 1.0008    | 0.0045%        | 0.08%         |        |
| 37                  | 23-Aug-05     | 1         | 5.8532% | 0.51%         | 5.8606%           | 0.9987    | -0.0074%       | -0.13%        |        |
| 38                  | 26-Aug-05     | 1         | 5.8593% | 0.51%         | 5.8606%           | 0.9998    | -0.0013%       | -0.02%        |        |
| 39                  | 13-Sep-05     | 1         | 5.8333% | 0.51%         | 5.8606%           | 0.9953    | -0.0273%       | -0.47%        |        |
| 40                  | 19-Sep-05     | 3         | 5.8971% | 0.52%         | 5.8606%           | 1.0062    | 0.0365%        | 0.62%         |        |
| 41                  | 22-Sep-05     | 2         | 5.8367% | 0.46%         | 5.8606%           | 0.9959    | -0.0239%       | -0.41%        |        |
| 42                  | 23-Sep-05     | 2         | 5.8685% | 0.45%         | 5.8606%           | 1.0013    | 0.0079%        | 0.13%         |        |
| 43                  | 06-Oct-05     | 3         | 5.8499% | 0.51%         | 5.8606%           | 0.9982    | -0.0107%       | -0.18%        |        |
| 44                  | 11-Oct-05     | 3         | 5.9042% | 0.47%         | 5.8606%           | 1.0074    | 0.0436%        | 0.74%         |        |
| 45                  | 15-Nov-05     | 1         | 5.8166% | 0.55%         | 5.8606%           | 0.9925    | -0.0440%       | -0.75%        |        |
| 46                  | 29-Nov-05     | 2         | 5.8832% | 0.51%         | 5.8606%           | 1.0039    | 0.0226%        | 0.39%         |        |
| 47                  | 07-Dec-05     | 2         | 5.8829% | 0.47%         | 5.8606%           | 1.0038    | 0.0223%        | 0.38%         |        |
| 48                  | 20-Dec-05     | 2         | 5.8228% | 0.48%         | 5.8606%           | 0.9935    | -0.0378%       | -0.65%        |        |
| Mean:               |               |           |         |               |                   |           | 0.9993         | -0.0044%      | -0.07% |
| Standard Deviation: |               |           |         |               |                   |           | 0.0041         | 0.0243%       | 0.41%  |
| Standard Error:     |               |           |         |               |                   |           | 0.0006         | 0.0035%       | 0.06%  |



**M.  $^{241}\text{Pu}$  ISOTOPE ABUNDANCE TABLES AND GRAPHS**



**RESULTS OF ANALYSIS OF Pu-241 DATA**  
**1st QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0002% | -0.0002% |
| Standard deviation (weight %)    | 0.0008% | 0.0005%  |
| certainty in the Mean (weight %) | 0.0001% | 0.0001%  |
| Mean Error (%)                   | 0.15%   | -0.16%   |
| Standard Deviation (%)           | 0.71%   | 0.45%    |
| Uncertainty in the Mean (%)      | 0.13%   | 0.13%    |
| Number of Data Points            | 30      | 12       |
| Number of Outliers               | 0       | 0        |

**Difference from Last Quarter in:**

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | -0.0002% | 0.0001%  |
| Standard deviation (weight %)    | 0.0003%  | -0.0003% |
| certainty in the Mean (weight %) | 0.0000%  | -0.0001% |
| Mean Error (%)                   | -0.19%   | 0.07%    |
| Standard Deviation (%)           | 0.24%    | -0.26%   |
| Uncertainty in the Mean (%)      | 0.04%    | -0.07%   |
| Number of Data Points            | 4        | 0        |
| Number of Outliers               | 0        | 0        |

**RESULTS OF ANALYSIS OF Pu-241 DATA  
2nd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0002% | -0.0001% |
| Standard deviation (weight %)    | 0.0005% | 0.0004%  |
| certainty in the Mean (weight %) | 0.0001% | 0.0001%  |
| Mean Error (%)                   | 0.19%   | 0.12%    |
| Standard Deviation (%)           | 0.47%   | 0.51%    |
| Uncertainty in the Mean (%)      | 0.11%   | 0.12%    |
| Number of Data Points            | 19      | 17       |
| Number of Outliers               | 0       | 0        |

**Difference from Last Quarter in:**

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | 0.0000%  | 0.0001%  |
| Standard deviation (weight %)    | -0.0003% | -0.0001% |
| certainty in the Mean (weight %) | 0.0000%  | 0.0000%  |
| Mean Error (%)                   | 0.05%    | 0.28%    |
| Standard Deviation (%)           | -0.24%   | 0.06%    |
| Uncertainty in the Mean (%)      | -0.02%   | -0.01%   |
| Number of Data Points            | -11      | 5        |
| Number of Outliers               | 0        | 0        |

**RESULTS OF ANALYSIS OF Pu-241 DATA  
3rd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0002% | -0.0001% |
| Standard deviation (weight %)    | 0.0005% | 0.0004%  |
| certainty in the Mean (weight %) | 0.0001% | 0.0001%  |
| Mean Error (%)                   | 0.28%   | -0.12%   |
| Standard Deviation (%)           | 0.43%   | 0.38%    |
| Uncertainty in the Mean (%)      | 0.09%   | 0.11%    |
| Number of Data Points            | 21      | 12       |
| Number of Outliers               | 0       | 0        |

**Difference from Last Quarter in:**

|                                  |         |         |
|----------------------------------|---------|---------|
| Mean error (weight %)            | 0.0000% | 0.0000% |
| Standard deviation (weight %)    | 0.0000% | 0.0000% |
| certainty in the Mean (weight %) | 0.0000% | 0.0000% |
| Mean Error (%)                   | 0.09%   | -0.24%  |
| Standard Deviation (%)           | -0.04%  | -0.13%  |
| Uncertainty in the Mean (%)      | -0.02%  | -0.01%  |
| Number of Data Points            | 2       | -5      |
| Number of Outliers               | 0       | 0       |

**RESULTS OF ANALYSIS OF Pu-241 DATA  
4th QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

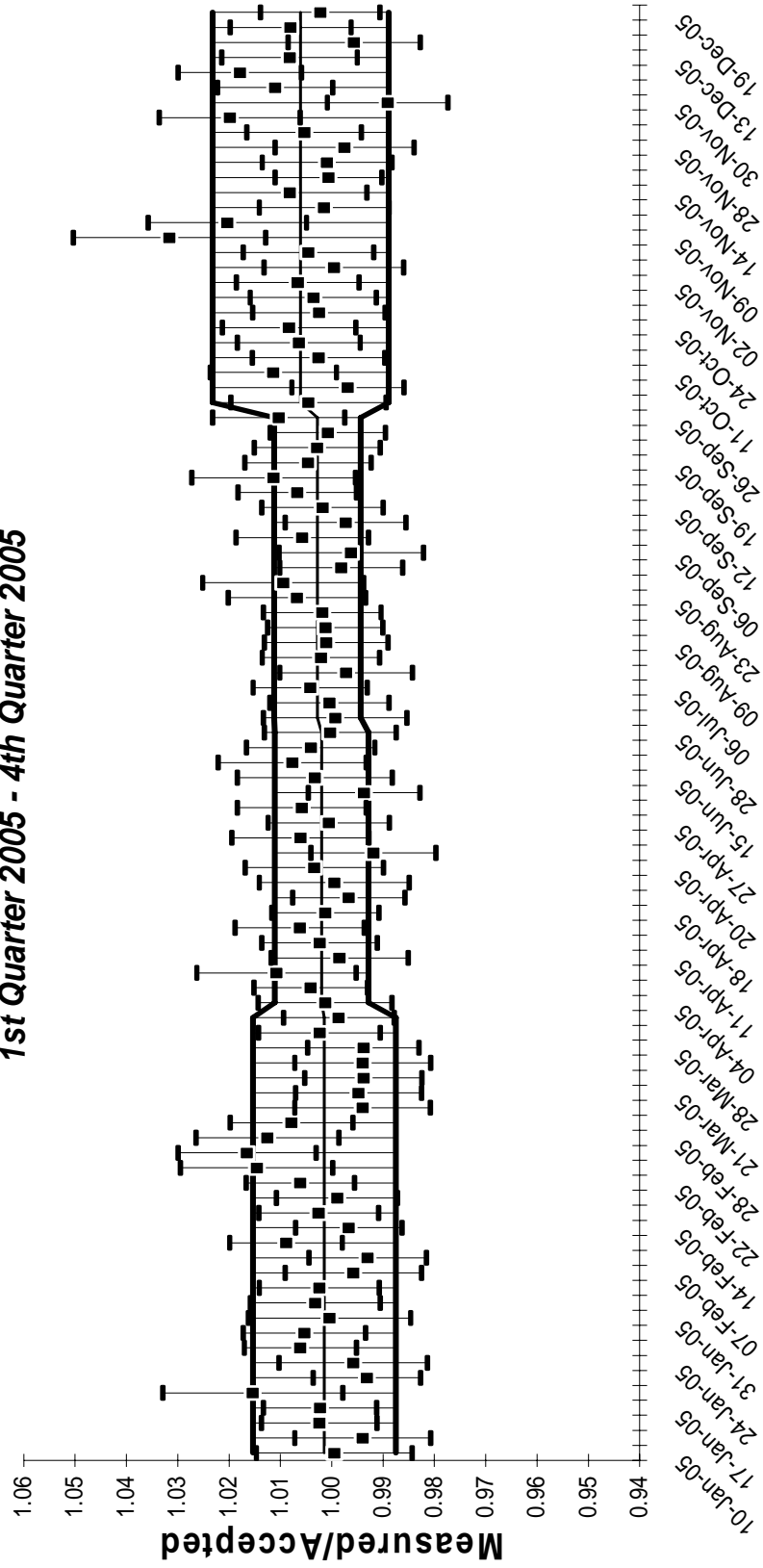
|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0006% | -0.0001% |
| Standard deviation (weight %)    | 0.0009% | 0.0009%  |
| certainty in the Mean (weight %) | 0.0002% | 0.0004%  |
| Mean Error (%)                   | 0.61%   | -0.06%   |
| Standard Deviation (%)           | 0.87%   | 0.91%    |
| Uncertainty in the Mean (%)      | 0.17%   | 0.37%    |
| Number of Data Points            | 27      | 6        |
| Number of Outliers               | 0       | 0        |

**Difference from Last Quarter in:**

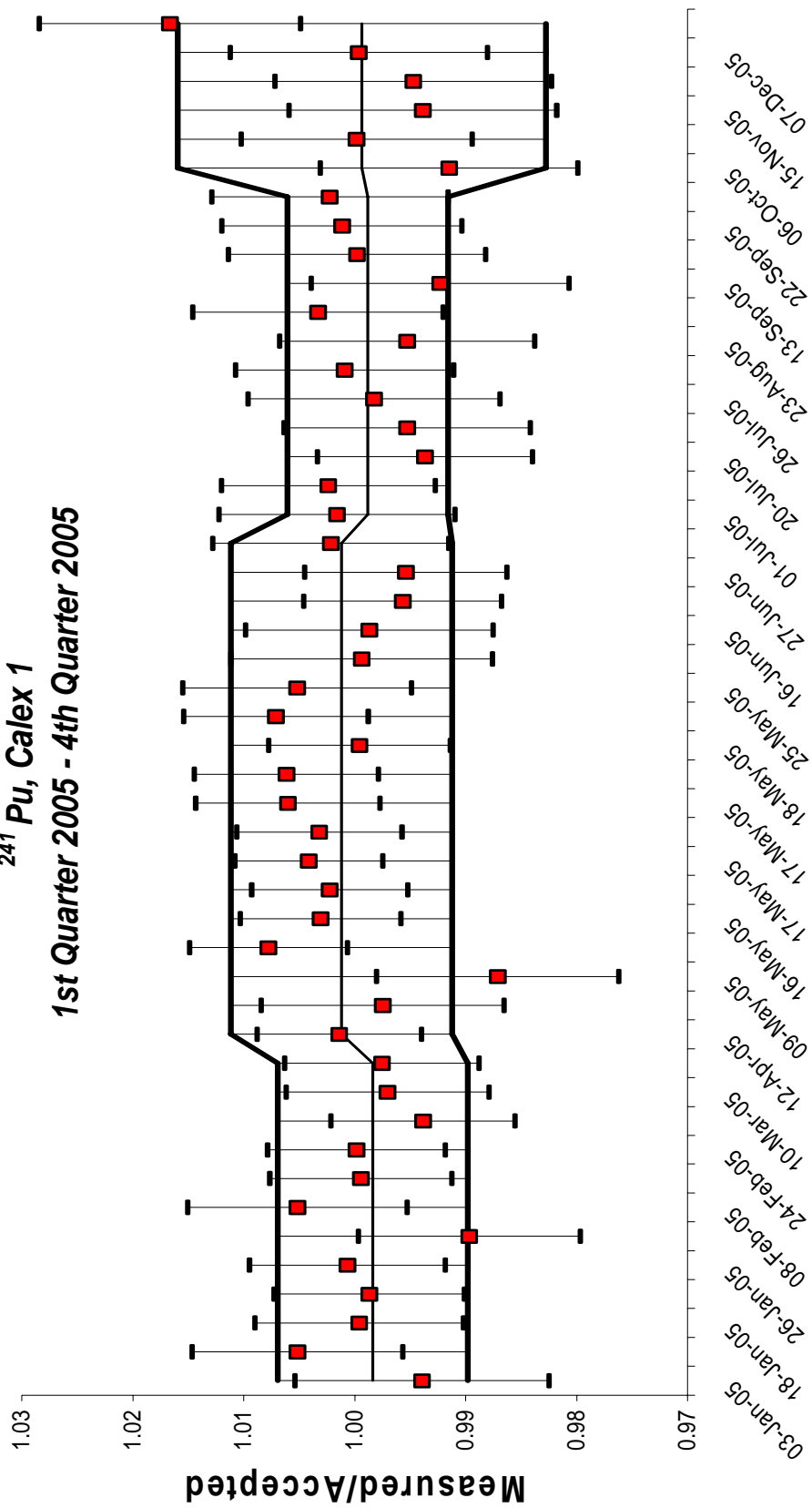
|                                  |         |         |
|----------------------------------|---------|---------|
| Mean error (weight %)            | 0.0004% | 0.0000% |
| Standard deviation (weight %)    | 0.0004% | 0.0005% |
| certainty in the Mean (weight %) | 0.0001% | 0.0003% |
| Mean Error (%)                   | 0.33%   | 0.06%   |
| Standard Deviation (%)           | 0.44%   | 0.53%   |
| Uncertainty in the Mean (%)      | 0.08%   | 0.26%   |
| Number of Data Points            | 6       | -6      |
| Number of Outliers               | 0       | 0       |



**HANFORD**  
**<sup>241</sup>Pu, Calex 1**  
**1st Quarter 2005 - 4th Quarter 2005**



**LAWRENCE LIVERMORE**  
<sup>241</sup>Pu, Calex 1  
 1st Quarter 2005 - 4th Quarter 2005



**RESULTS OF ANALYSIS OF Pu-241 DATA  
2005**

|                                  | Hanford Calex 1 | LLNL Calex 1 |
|----------------------------------|-----------------|--------------|
| Mean error (weight %)            | 0.0003%         | 0.0000%      |
| Standard deviation (weight %)    | 0.0007%         | 0.0006%      |
| certainty in the Mean (weight %) | 0.0001%         | 0.0001%      |
| Mean Error (%)                   | 0.31%           | -0.03%       |
| Standard Deviation (%)           | 0.69%           | 0.53%        |
| Uncertainty in the Mean (%)      | 0.07%           | 0.08%        |
| Number of Data Points            | 97              | 48           |
| Number of Outliers               | 0               | 0            |

**Difference from Last Year in:**

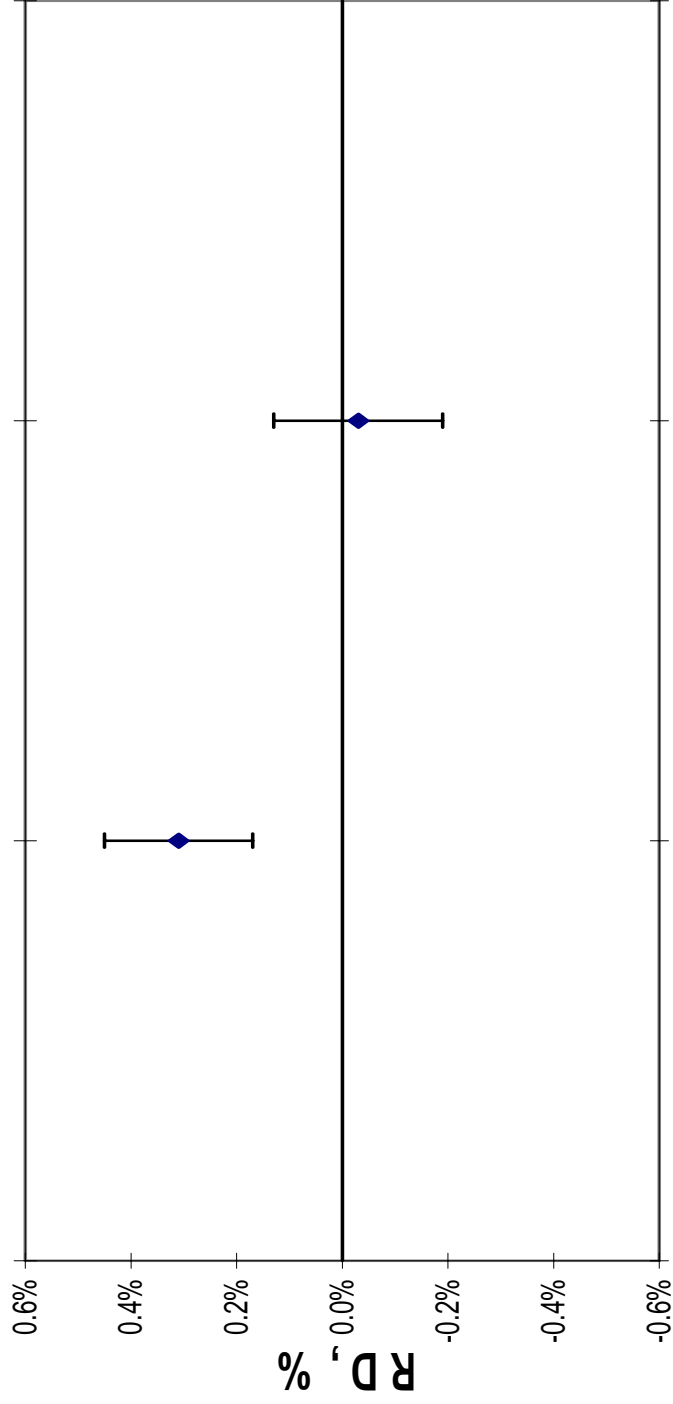
|                                  |         |         |
|----------------------------------|---------|---------|
| Mean error (weight %)            | 0.0001% | 0.0000% |
| Standard deviation (weight %)    | 0.0000% | 0.0000% |
| certainty in the Mean (weight %) | 0.0000% | 0.0000% |
| Mean Error (%)                   | 0.09%   | -0.02%  |
| Standard Deviation (%)           | 0.07%   | -0.04%  |
| Uncertainty in the Mean (%)      | 0.02%   | 0.01%   |
| Number of Data Points            | -50     | -28     |
| Number of Outliers               | -1      | 0       |

# New Brunswick Laboratory Calorimetry Exchange Program

## Percent $^{241}\text{Pu}$ , 2005

N=97

N=48



Hanford Calex1

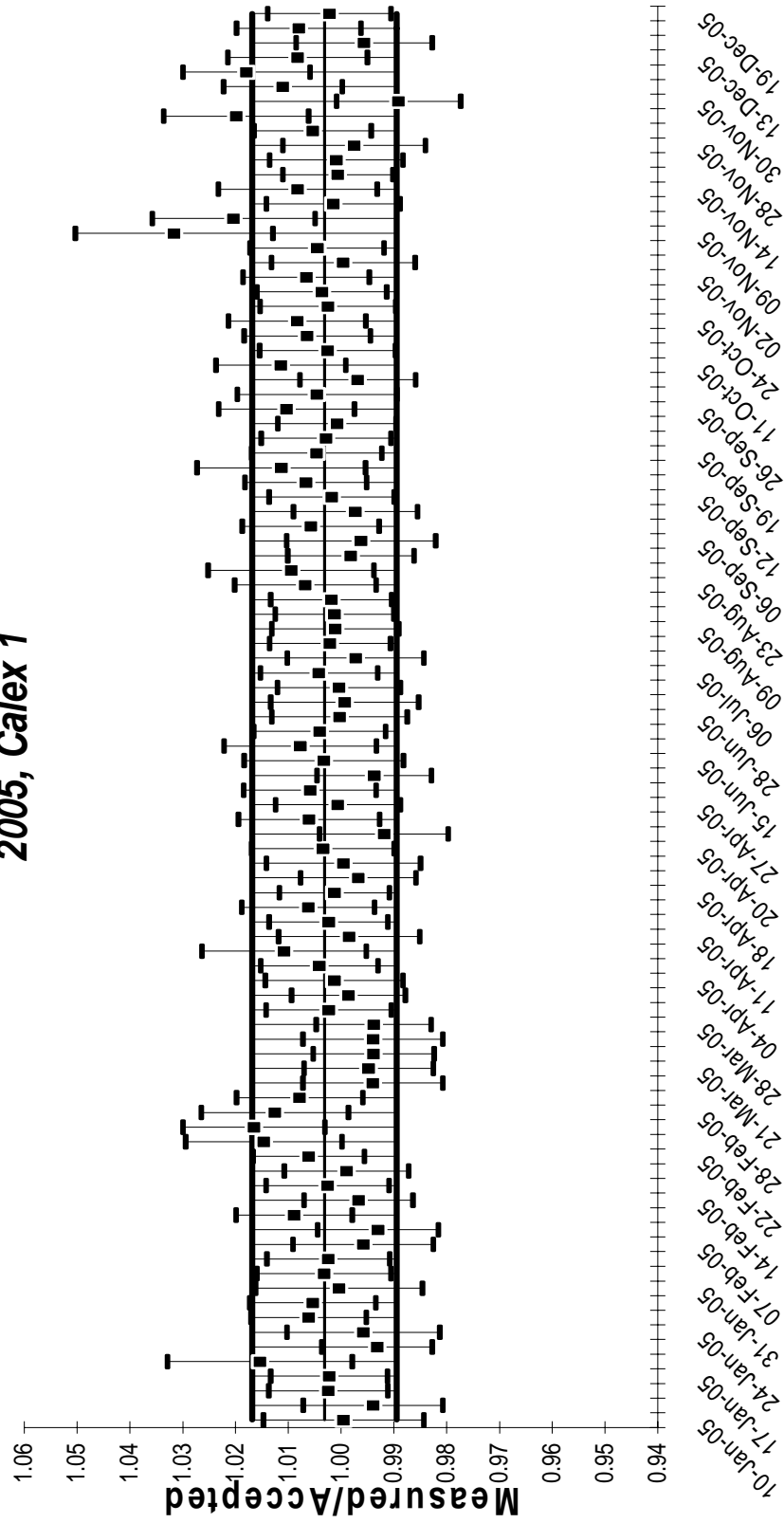
LLNL Calex1

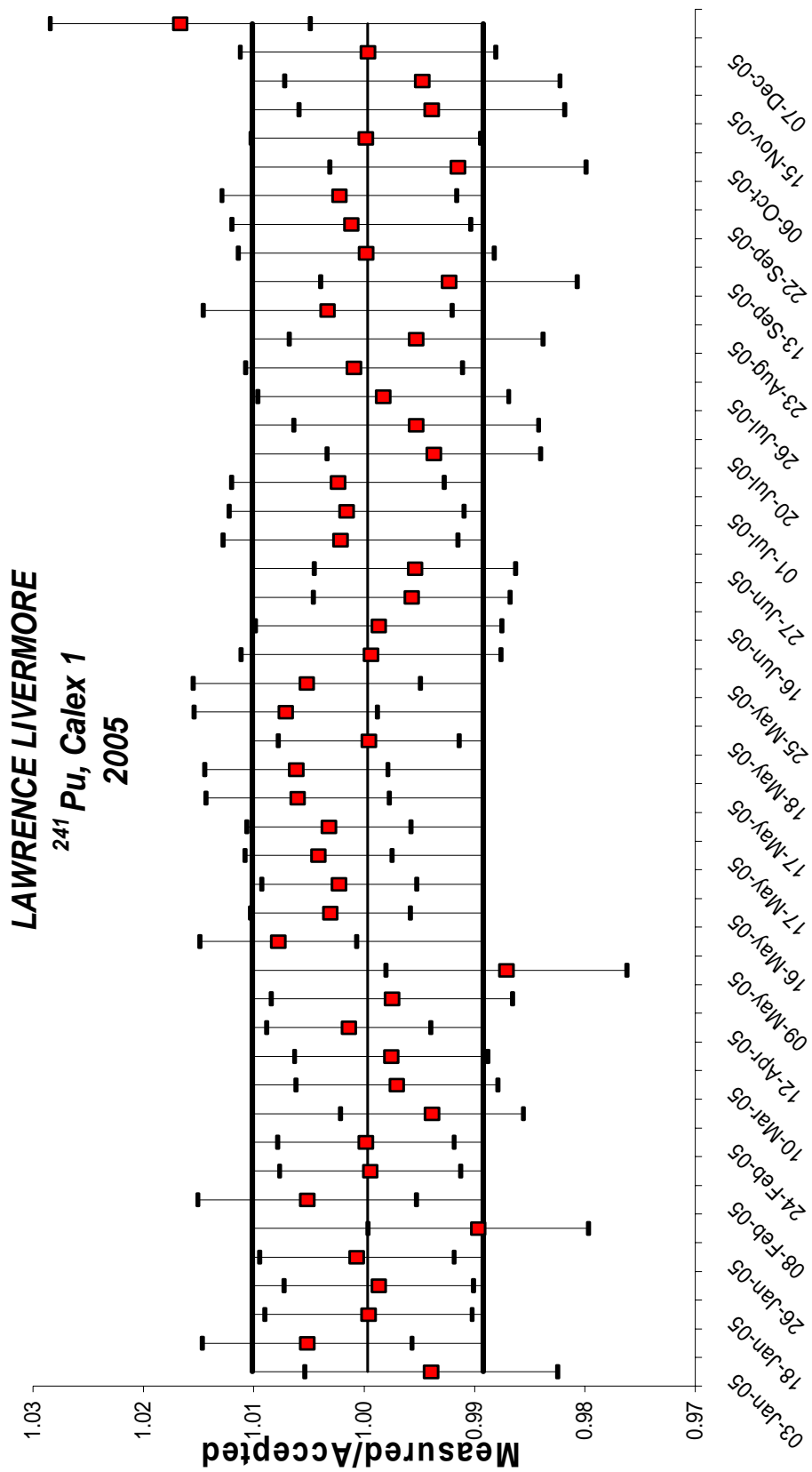
**Laboratory**

◆ Laboratory Mean

— 95% Confidence Interval

**HANFORD**  
**<sup>241</sup>Pu**  
**2005, Calex 1**





**WEIGHT PERCENT 241-Pu DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #  | Date Measured | Instr. ID | 241-Pu  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|----|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|
| 1  | 10-Jan-05     | 2424      | 0.1080% | 0.76%         | 0.1081%           | 0.9995    | -0.0001%       | -0.05%        |
| 2  | 10-Jan-05     | 2026      | 0.1074% | 0.67%         | 0.1081%           | 0.9939    | -0.0007%       | -0.61%        |
| 3  | 11-Jan-05     | 2740      | 0.1083% | 0.56%         | 0.1080%           | 1.0024    | 0.0003%        | 0.24%         |
| 4  | 17-Jan-05     | 2740      | 0.1082% | 0.55%         | 0.1080%           | 1.0022    | 0.0002%        | 0.22%         |
| 5  | 18-Jan-05     | 2424      | 0.1096% | 0.85%         | 0.1079%           | 1.0153    | 0.0017%        | 1.53%         |
| 6  | 18-Jan-05     | 2026      | 0.1072% | 0.53%         | 0.1079%           | 0.9931    | -0.0007%       | -0.69%        |
| 7  | 24-Jan-05     | 2424      | 0.1074% | 0.73%         | 0.1079%           | 0.9958    | -0.0005%       | -0.42%        |
| 8  | 25-Jan-05     | 2026      | 0.1085% | 0.54%         | 0.1078%           | 1.0061    | 0.0007%        | 0.61%         |
| 9  | 26-Jan-05     | 2740      | 0.1084% | 0.59%         | 0.1078%           | 1.0053    | 0.0006%        | 0.53%         |
| 10 | 31-Jan-05     | 2424      | 0.1078% | 0.79%         | 0.1078%           | 1.0004    | 0.0000%        | 0.04%         |
| 11 | 31-Jan-05     | 2026      | 0.1081% | 0.63%         | 0.1078%           | 1.0032    | 0.0003%        | 0.32%         |
| 12 | 01-Feb-05     | 2740      | 0.1080% | 0.58%         | 0.1077%           | 1.0024    | 0.0003%        | 0.24%         |
| 13 | 07-Feb-05     | 2424      | 0.1072% | 0.67%         | 0.1077%           | 0.9957    | -0.0005%       | -0.43%        |
| 14 | 07-Feb-05     | 2026      | 0.1069% | 0.58%         | 0.1077%           | 0.9929    | -0.0008%       | -0.71%        |
| 15 | 08-Feb-05     | 2740      | 0.1086% | 0.54%         | 0.1076%           | 1.0089    | 0.0010%        | 0.89%         |
| 16 | 14-Feb-05     | 2740      | 0.1072% | 0.52%         | 0.1076%           | 0.9967    | -0.0004%       | -0.33%        |
| 17 | 16-Feb-05     | 2424      | 0.1078% | 0.58%         | 0.1075%           | 1.0025    | 0.0003%        | 0.25%         |
| 18 | 17-Feb-05     | 2026      | 0.1074% | 0.59%         | 0.1075%           | 0.9989    | -0.0001%       | -0.11%        |
| 19 | 22-Feb-05     | 2740      | 0.1081% | 0.52%         | 0.1074%           | 1.0061    | 0.0007%        | 0.61%         |
| 20 | 23-Feb-05     | 2424      | 0.1090% | 0.72%         | 0.1074%           | 1.0146    | 0.0016%        | 1.46%         |
| 21 | 23-Feb-05     | 2026      | 0.1092% | 0.65%         | 0.1074%           | 1.0165    | 0.0018%        | 1.65%         |
| 22 | 28-Feb-05     | 2424      | 0.1087% | 0.68%         | 0.1074%           | 1.0125    | 0.0013%        | 1.25%         |
| 23 | 14-Mar-05     | 2740      | 0.1080% | 0.59%         | 0.1072%           | 1.0078    | 0.0008%        | 0.78%         |
| 24 | 15-Mar-05     | 2424      | 0.1065% | 0.67%         | 0.1071%           | 0.9939    | -0.0006%       | -0.61%        |
| 25 | 21-Mar-05     | 2026      | 0.1065% | 0.62%         | 0.1071%           | 0.9947    | -0.0006%       | -0.53%        |
| 26 | 21-Mar-05     | 2740      | 0.1064% | 0.58%         | 0.1071%           | 0.9938    | -0.0007%       | -0.62%        |
| 27 | 22-Mar-05     | 2424      | 0.1064% | 0.67%         | 0.1071%           | 0.9939    | -0.0007%       | -0.61%        |
| 28 | 28-Mar-05     | 2026      | 0.1063% | 0.55%         | 0.1070%           | 0.9938    | -0.0007%       | -0.62%        |
| 29 | 29-Mar-05     | 2424      | 0.1072% | 0.59%         | 0.1070%           | 1.0023    | 0.0002%        | 0.23%         |
| 30 | 29-Mar-05     | 2740      | 0.1068% | 0.54%         | 0.1070%           | 0.9986    | -0.0002%       | -0.14%        |
| 31 | 04-Apr-05     | 2026      | 0.1070% | 0.65%         | 0.1069%           | 1.0013    | 0.0001%        | 0.13%         |
| 32 | 04-Apr-05     | 2740      | 0.1073% | 0.55%         | 0.1069%           | 1.0041    | 0.0004%        | 0.41%         |
| 33 | 05-Apr-05     | 2424      | 0.1080% | 0.76%         | 0.1069%           | 1.0107    | 0.0011%        | 1.07%         |
| 34 | 11-Apr-05     | 2026      | 0.1066% | 0.67%         | 0.1068%           | 0.9984    | -0.0002%       | -0.16%        |
| 35 | 12-Apr-05     | 2740      | 0.1070% | 0.56%         | 0.1068%           | 1.0023    | 0.0002%        | 0.23%         |
| 36 | 13-Apr-05     | 2424      | 0.1074% | 0.62%         | 0.1067%           | 1.0062    | 0.0007%        | 0.62%         |
| 37 | 18-Apr-05     | 2740      | 0.1068% | 0.52%         | 0.1067%           | 1.0012    | 0.0001%        | 0.12%         |
| 38 | 19-Apr-05     | 2026      | 0.1063% | 0.55%         | 0.1067%           | 0.9967    | -0.0004%       | -0.33%        |
| 39 | 19-Apr-05     | 2424      | 0.1066% | 0.73%         | 0.1067%           | 0.9995    | -0.0001%       | -0.05%        |
| 40 | 20-Apr-05     | 2424      | 0.1070% | 0.67%         | 0.1066%           | 1.0034    | 0.0004%        | 0.34%         |
| 41 | 25-Apr-05     | 2740      | 0.1057% | 0.62%         | 0.1066%           | 0.9918    | -0.0009%       | -0.82%        |
| 42 | 26-Apr-05     | 2424      | 0.1072% | 0.66%         | 0.1066%           | 1.0060    | 0.0006%        | 0.60%         |
| 43 | 27-Apr-05     | 2026      | 0.1066% | 0.59%         | 0.1065%           | 1.0005    | 0.0001%        | 0.05%         |
| 44 | 13-Jun-05     | 2026      | 0.1065% | 0.62%         | 0.1059%           | 1.0058    | 0.0006%        | 0.58%         |
| 45 | 14-Jun-05     | 2740      | 0.1052% | 0.55%         | 0.1059%           | 0.9937    | -0.0007%       | -0.63%        |
| 46 | 15-Jun-05     | 2424      | 0.1062% | 0.75%         | 0.1059%           | 1.0033    | 0.0003%        | 0.33%         |
| 47 | 27-Jun-05     | 2424      | 0.1065% | 0.71%         | 0.1057%           | 1.0077    | 0.0008%        | 0.77%         |
| 48 | 28-Jun-05     | 2026      | 0.1061% | 0.62%         | 0.1057%           | 1.0040    | 0.0004%        | 0.40%         |
| 49 | 28-Jun-05     | 2740      | 0.1057% | 0.64%         | 0.1057%           | 1.0002    | 0.0000%        | 0.02%         |
| 50 | 05-Jul-05     | 2424      | 0.1055% | 0.70%         | 0.1056%           | 0.9993    | -0.0001%       | -0.07%        |

**WEIGHT PERCENT 241-Pu DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #                   | Date Measured | Instr. ID | 241-Pu  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|---------------------|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|
| 51                  | 06-Jul-05     | 2026      | 0.1056% | 0.58%         | 0.1056%           | 1.0004    | 0.0000%        | 0.04%         |
| 52                  | 06-Jul-05     | 2740      | 0.1060% | 0.55%         | 0.1056%           | 1.0041    | 0.0004%        | 0.41%         |
| 53                  | 25-Jul-05     | 2424      | 0.1050% | 0.65%         | 0.1053%           | 0.9972    | -0.0003%       | -0.28%        |
| 54                  | 26-Jul-05     | 2026      | 0.1055% | 0.57%         | 0.1053%           | 1.0021    | 0.0002%        | 0.21%         |
| 55                  | 09-Aug-05     | 2026      | 0.1052% | 0.60%         | 0.1051%           | 1.0011    | 0.0001%        | 0.11%         |
| 56                  | 10-Aug-05     | 2740      | 0.1052% | 0.56%         | 0.1051%           | 1.0012    | 0.0001%        | 0.12%         |
| 57                  | 22-Aug-05     | 2740      | 0.1051% | 0.57%         | 0.1049%           | 1.0018    | 0.0002%        | 0.18%         |
| 58                  | 23-Aug-05     | 2026      | 0.1056% | 0.66%         | 0.1049%           | 1.0067    | 0.0007%        | 0.67%         |
| 59                  | 29-Aug-05     | 2424      | 0.1058% | 0.77%         | 0.1048%           | 1.0094    | 0.0010%        | 0.94%         |
| 60                  | 30-Aug-05     | 2026      | 0.1046% | 0.60%         | 0.1048%           | 0.9981    | -0.0002%       | -0.19%        |
| 61                  | 06-Sep-05     | 2424      | 0.1043% | 0.71%         | 0.1047%           | 0.9962    | -0.0004%       | -0.38%        |
| 62                  | 06-Sep-05     | 2026      | 0.1053% | 0.64%         | 0.1047%           | 1.0057    | 0.0006%        | 0.57%         |
| 63                  | 07-Sep-05     | 2740      | 0.1044% | 0.59%         | 0.1047%           | 0.9972    | -0.0003%       | -0.28%        |
| 64                  | 12-Sep-05     | 2740      | 0.1048% | 0.59%         | 0.1046%           | 1.0017    | 0.0002%        | 0.17%         |
| 65                  | 13-Sep-05     | 2026      | 0.1053% | 0.57%         | 0.1046%           | 1.0066    | 0.0007%        | 0.66%         |
| 66                  | 19-Sep-05     | 2424      | 0.1057% | 0.78%         | 0.1045%           | 1.0113    | 0.0012%        | 1.13%         |
| 67                  | 19-Sep-05     | 2026      | 0.1050% | 0.61%         | 0.1045%           | 1.0046    | 0.0005%        | 0.46%         |
| 68                  | 20-Sep-05     | 2740      | 0.1048% | 0.61%         | 0.1045%           | 1.0028    | 0.0003%        | 0.28%         |
| 69                  | 26-Sep-05     | 2740      | 0.1045% | 0.56%         | 0.1044%           | 1.0007    | 0.0001%        | 0.07%         |
| 70                  | 26-Sep-05     | 2026      | 0.1055% | 0.63%         | 0.1044%           | 1.0103    | 0.0011%        | 1.03%         |
| 71                  | 03-Oct-05     | 2424      | 0.1048% | 0.75%         | 0.1043%           | 1.0045    | 0.0005%        | 0.45%         |
| 72                  | 10-Oct-05     | 2740      | 0.1039% | 0.55%         | 0.1042%           | 0.9968    | -0.0003%       | -0.32%        |
| 73                  | 11-Oct-05     | 2026      | 0.1054% | 0.60%         | 0.1042%           | 1.0113    | 0.0012%        | 1.13%         |
| 74                  | 17-Oct-05     | 2026      | 0.1044% | 0.64%         | 0.1041%           | 1.0025    | 0.0003%        | 0.25%         |
| 75                  | 17-Oct-05     | 2740      | 0.1048% | 0.59%         | 0.1041%           | 1.0064    | 0.0007%        | 0.64%         |
| 76                  | 24-Oct-05     | 2740      | 0.1049% | 0.64%         | 0.1040%           | 1.0083    | 0.0009%        | 0.83%         |
| 77                  | 31-Oct-05     | 2740      | 0.1042% | 0.64%         | 0.1039%           | 1.0025    | 0.0003%        | 0.25%         |
| 78                  | 01-Nov-05     | 2026      | 0.1043% | 0.61%         | 0.1039%           | 1.0036    | 0.0004%        | 0.36%         |
| 79                  | 02-Nov-05     | 2740      | 0.1046% | 0.59%         | 0.1039%           | 1.0066    | 0.0007%        | 0.66%         |
| 80                  | 07-Nov-05     | 2026      | 0.1038% | 0.68%         | 0.1038%           | 0.9995    | 0.0000%        | -0.05%        |
| 81                  | 08-Nov-05     | 2740      | 0.1043% | 0.63%         | 0.1038%           | 1.0045    | 0.0005%        | 0.45%         |
| 82                  | 09-Nov-05     | 2347      | 0.1071% | 0.88%         | 0.1038%           | 1.0316    | 0.0033%        | 3.16%         |
| 83                  | 11-Nov-05     | 2347      | 0.1059% | 0.74%         | 0.1038%           | 1.0203    | 0.0021%        | 2.03%         |
| 84                  | 14-Nov-05     | 2026      | 0.1039% | 0.63%         | 0.1038%           | 1.0014    | 0.0001%        | 0.14%         |
| 85                  | 14-Nov-05     | 2347      | 0.1046% | 0.74%         | 0.1038%           | 1.0082    | 0.0008%        | 0.82%         |
| 86                  | 15-Nov-05     | 2740      | 0.1038% | 0.52%         | 0.1037%           | 1.0006    | 0.0001%        | 0.06%         |
| 87                  | 17-Nov-05     | 2347      | 0.1038% | 0.63%         | 0.1037%           | 1.0009    | 0.0001%        | 0.09%         |
| 88                  | 28-Nov-05     | 2026      | 0.1033% | 0.68%         | 0.1036%           | 0.9975    | -0.0003%       | -0.25%        |
| 89                  | 29-Nov-05     | 2740      | 0.1041% | 0.55%         | 0.1035%           | 1.0053    | 0.0006%        | 0.53%         |
| 90                  | 29-Nov-05     | 2347      | 0.1056% | 0.66%         | 0.1035%           | 1.0198    | 0.0021%        | 1.98%         |
| 91                  | 30-Nov-05     | 2347      | 0.1024% | 0.60%         | 0.1035%           | 0.9891    | -0.0011%       | -1.09%        |
| 92                  | 05-Dec-05     | 2026      | 0.1046% | 0.55%         | 0.1035%           | 1.0110    | 0.0011%        | 1.10%         |
| 93                  | 06-Dec-05     | 2740      | 0.1053% | 0.58%         | 0.1035%           | 1.0179    | 0.0018%        | 1.79%         |
| 94                  | 13-Dec-05     | 2026      | 0.1042% | 0.65%         | 0.1034%           | 1.0082    | 0.0008%        | 0.82%         |
| 95                  | 13-Dec-05     | 2740      | 0.1029% | 0.65%         | 0.1034%           | 0.9956    | -0.0005%       | -0.44%        |
| 96                  | 19-Dec-05     | 2026      | 0.1041% | 0.58%         | 0.1033%           | 1.0080    | 0.0008%        | 0.80%         |
| 97                  | 19-Dec-05     | 2740      | 0.1035% | 0.58%         | 0.1033%           | 1.0022    | 0.0002%        | 0.22%         |
| Mean:               |               |           |         |               |                   | 1.0031    | 0.0003%        | 0.31%         |
| Standard Deviation: |               |           |         |               |                   | 0.0069    | 0.0007%        | 0.69%         |
| Standard Error:     |               |           |         |               |                   | 0.0007    | 0.0001%        | 0.07%         |



**WEIGHT PERCENT 241-Pu DATA**  
**Calendar Year 2005**

**LLNL Calex 1**

| #                   | Date Measured | Instr. ID | 241-Pu  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|---------------------|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|
| 1                   | 03-Jan-05     | 3         | 0.1075% | 0.58%         | 0.1082%           | 0.9939    | -0.0007%       | -0.61%        |
| 2                   | 11-Jan-05     | 2         | 0.1086% | 0.47%         | 0.1080%           | 1.0052    | 0.0006%        | 0.52%         |
| 3                   | 18-Jan-05     | 3         | 0.1079% | 0.47%         | 0.1079%           | 0.9996    | 0.0000%        | -0.04%        |
| 4                   | 25-Jan-05     | 1         | 0.1077% | 0.43%         | 0.1078%           | 0.9987    | -0.0001%       | -0.13%        |
| 5                   | 26-Jan-05     | 2         | 0.1079% | 0.44%         | 0.1078%           | 1.0006    | 0.0001%        | 0.06%         |
| 6                   | 27-Jan-05     | 3         | 0.1067% | 0.51%         | 0.1078%           | 0.9897    | -0.0011%       | -1.03%        |
| 7                   | 08-Feb-05     | 2         | 0.1082% | 0.49%         | 0.1076%           | 1.0052    | 0.0006%        | 0.52%         |
| 8                   | 14-Feb-05     | 1         | 0.1075% | 0.41%         | 0.1076%           | 0.9994    | -0.0001%       | -0.06%        |
| 9                   | 24-Feb-05     | 3         | 0.1074% | 0.40%         | 0.1074%           | 0.9998    | 0.0000%        | -0.02%        |
| 10                  | 28-Feb-05     | 1         | 0.1067% | 0.42%         | 0.1074%           | 0.9938    | -0.0007%       | -0.62%        |
| 11                  | 10-Mar-05     | 2         | 0.1069% | 0.46%         | 0.1072%           | 0.9970    | -0.0003%       | -0.30%        |
| 12                  | 21-Mar-05     | 3         | 0.1068% | 0.44%         | 0.1071%           | 0.9975    | -0.0003%       | -0.25%        |
| 13                  | 12-Apr-05     | 1         | 0.1069% | 0.37%         | 0.1068%           | 1.0014    | 0.0001%        | 0.14%         |
| 14                  | 18-Apr-05     | 3         | 0.1064% | 0.55%         | 0.1067%           | 0.9975    | -0.0003%       | -0.25%        |
| 15                  | 09-May-05     | 3         | 0.1050% | 0.56%         | 0.1064%           | 0.9871    | -0.0014%       | -1.29%        |
| 16                  | 16-May-05     | 1         | 0.1071% | 0.35%         | 0.1063%           | 1.0078    | 0.0008%        | 0.78%         |
| 17                  | 16-May-05     | 1         | 0.1066% | 0.36%         | 0.1063%           | 1.0031    | 0.0003%        | 0.31%         |
| 18                  | 17-May-05     | 1         | 0.1065% | 0.35%         | 0.1063%           | 1.0022    | 0.0002%        | 0.22%         |
| 19                  | 17-May-05     | 1         | 0.1067% | 0.33%         | 0.1063%           | 1.0041    | 0.0004%        | 0.41%         |
| 20                  | 17-May-05     | 1         | 0.1066% | 0.37%         | 0.1063%           | 1.0032    | 0.0003%        | 0.32%         |
| 21                  | 17-May-05     | 1         | 0.1069% | 0.41%         | 0.1063%           | 1.0060    | 0.0006%        | 0.60%         |
| 22                  | 18-May-05     | 1         | 0.1069% | 0.41%         | 0.1062%           | 1.0061    | 0.0007%        | 0.61%         |
| 23                  | 18-May-05     | 1         | 0.1062% | 0.41%         | 0.1062%           | 0.9996    | 0.0000%        | -0.04%        |
| 24                  | 18-May-05     | 1         | 0.1070% | 0.41%         | 0.1062%           | 1.0071    | 0.0008%        | 0.71%         |
| 25                  | 25-May-05     | 3         | 0.1067% | 0.51%         | 0.1061%           | 1.0052    | 0.0006%        | 0.52%         |
| 26                  | 07-Jun-05     | 3         | 0.1059% | 0.59%         | 0.1060%           | 0.9994    | -0.0001%       | -0.06%        |
| 27                  | 16-Jun-05     | 1         | 0.1057% | 0.56%         | 0.1058%           | 0.9987    | -0.0001%       | -0.13%        |
| 28                  | 22-Jun-05     | 3         | 0.1053% | 0.45%         | 0.1058%           | 0.9957    | -0.0005%       | -0.43%        |
| 29                  | 27-Jun-05     | 3         | 0.1052% | 0.46%         | 0.1057%           | 0.9954    | -0.0005%       | -0.46%        |
| 30                  | 28-Jun-05     | 1         | 0.1059% | 0.53%         | 0.1057%           | 1.0021    | 0.0002%        | 0.21%         |
| 31                  | 01-Jul-05     | 1         | 0.1058% | 0.53%         | 0.1056%           | 1.0016    | 0.0002%        | 0.16%         |
| 32                  | 14-Jul-05     | 1         | 0.1057% | 0.48%         | 0.1055%           | 1.0024    | 0.0002%        | 0.24%         |
| 33                  | 20-Jul-05     | 3         | 0.1047% | 0.49%         | 0.1054%           | 0.9937    | -0.0007%       | -0.63%        |
| 34                  | 25-Jul-05     | 1         | 0.1048% | 0.56%         | 0.1053%           | 0.9953    | -0.0005%       | -0.47%        |
| 35                  | 26-Jul-05     | 3         | 0.1051% | 0.57%         | 0.1053%           | 0.9983    | -0.0002%       | -0.17%        |
| 36                  | 15-Aug-05     | 3         | 0.1051% | 0.49%         | 0.1050%           | 1.0009    | 0.0001%        | 0.09%         |
| 37                  | 23-Aug-05     | 1         | 0.1044% | 0.58%         | 0.1049%           | 0.9953    | -0.0005%       | -0.47%        |
| 38                  | 26-Aug-05     | 1         | 0.1052% | 0.56%         | 0.1049%           | 1.0033    | 0.0003%        | 0.33%         |
| 39                  | 13-Sep-05     | 1         | 0.1038% | 0.59%         | 0.1046%           | 0.9923    | -0.0008%       | -0.77%        |
| 40                  | 19-Sep-05     | 3         | 0.1045% | 0.58%         | 0.1045%           | 0.9998    | 0.0000%        | -0.02%        |
| 41                  | 22-Sep-05     | 2         | 0.1046% | 0.54%         | 0.1045%           | 1.0011    | 0.0001%        | 0.11%         |
| 42                  | 23-Sep-05     | 2         | 0.1047% | 0.53%         | 0.1045%           | 1.0022    | 0.0002%        | 0.22%         |
| 43                  | 06-Oct-05     | 3         | 0.1034% | 0.59%         | 0.1043%           | 0.9915    | -0.0009%       | -0.85%        |
| 44                  | 11-Oct-05     | 3         | 0.1042% | 0.52%         | 0.1042%           | 0.9998    | 0.0000%        | -0.02%        |
| 45                  | 15-Nov-05     | 1         | 0.1031% | 0.61%         | 0.1037%           | 0.9938    | -0.0006%       | -0.62%        |
| 46                  | 29-Nov-05     | 2         | 0.1030% | 0.63%         | 0.1035%           | 0.9947    | -0.0005%       | -0.53%        |
| 47                  | 07-Dec-05     | 2         | 0.1034% | 0.58%         | 0.1034%           | 0.9996    | 0.0000%        | -0.04%        |
| 48                  | 20-Dec-05     | 2         | 0.1050% | 0.57%         | 0.1033%           | 1.0167    | 0.0017%        | 1.67%         |
| Mean:               |               |           |         |               |                   | 0.9997    | 0.0000%        | -0.03%        |
| Standard Deviation: |               |           |         |               |                   | 0.0053    | 0.0006%        | 0.53%         |
| Standard Error:     |               |           |         |               |                   | 0.0008    | 0.0001%        | 0.08%         |



**N. <sup>241</sup>Am ISOTOPE ABUNDANCE TABLES AND GRAPHS**



**RESULTS OF ANALYSIS OF Am-241 DATA**  
**1st QUARTER 2005**

|                                  | Hanford Calex 1 | LLNL Calex 1 |
|----------------------------------|-----------------|--------------|
| Mean error (weight %)            | -0.0011%        | -0.0017%     |
| Standard deviation (weight %)    | 0.0012%         | 0.0014%      |
| certainty in the Mean (weight %) | 0.0002%         | 0.0004%      |
| Mean Error (%)                   | -0.41%          | -0.63%       |
| Standard Deviation (%)           | 0.45%           | 0.53%        |
| Uncertainty in the Mean (%)      | 0.08%           | 0.15%        |
| Number of Data Points            | 30              | 12           |
| Number of Outliers               | 0               | 0            |

**Difference from Last Quarter in:**

|                                  |          |         |
|----------------------------------|----------|---------|
| Mean error (weight %)            | 0.0004%  | 0.0002% |
| Standard deviation (weight %)    | -0.0004% | 0.0000% |
| certainty in the Mean (weight %) | -0.0001% | 0.0000% |
| Mean Error (%)                   | 0.14%    | 0.07%   |
| Standard Deviation (%)           | -0.14%   | -0.01%  |
| Uncertainty in the Mean (%)      | -0.04%   | -0.01%  |
| Number of Data Points            | 4        | 0       |
| Number of Outliers               | 0        | 0       |

**RESULTS OF ANALYSIS OF Am-241 DATA  
2nd QUARTER 2005**

Hanford Calex 1 LLNL Calex 1

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | -0.0006% | -0.0016% |
| Standard deviation (weight %)    | 0.0013%  | 0.0011%  |
| certainty in the Mean (weight %) | 0.0003%  | 0.0003%  |
| Mean Error (%)                   | -0.31%   | -0.62%   |
| Standard Deviation (%)           | 0.45%    | 0.41%    |
| Uncertainty in the Mean (%)      | 0.10%    | 0.10%    |
| Number of Data Points            | 19       | 18       |
| Number of Outliers               | 0        | 0        |

**Difference from Last Quarter in:**

|                                  |         |          |
|----------------------------------|---------|----------|
| Mean error (weight %)            | 0.0005% | 0.0001%  |
| Standard deviation (weight %)    | 0.0001% | -0.0003% |
| certainty in the Mean (weight %) | 0.0001% | -0.0001% |
| Mean Error (%)                   | 0.10%   | -0.01%   |
| Standard Deviation (%)           | 0.00%   | -0.12%   |
| Uncertainty in the Mean (%)      | 0.02%   | -0.05%   |
| Number of Data Points            | -11     | 6        |
| Number of Outliers               | 0       | 0        |

**RESULTS OF ANALYSIS OF Am-241 DATA**  
**3rd QUARTER 2005**

|                                  | Hanford Calex 1 | LLNL Calex 1 |
|----------------------------------|-----------------|--------------|
| Mean error (weight %)            | -0.0012%        | -0.0013%     |
| Standard deviation (weight %)    | 0.0014%         | 0.0010%      |
| certainty in the Mean (weight %) | 0.0003%         | 0.0003%      |
| Mean Error (%)                   | -0.46%          | -0.50%       |
| Standard Deviation (%)           | 0.52%           | 0.37%        |
| Uncertainty in the Mean (%)      | 0.11%           | 0.11%        |
| Number of Data Points            | 21              | 12           |
| Number of Outliers               | 0               | 0            |

**Difference from Last Quarter in:**

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | -0.0006% | 0.0003%  |
| Standard deviation (weight %)    | 0.0001%  | -0.0001% |
| certainty in the Mean (weight %) | 0.0000%  | 0.0000%  |
| Mean Error (%)                   | -0.15%   | 0.12%    |
| Standard Deviation (%)           | 0.07%    | -0.04%   |
| Uncertainty in the Mean (%)      | 0.01%    | 0.01%    |
| Number of Data Points            | 2        | -6       |
| Number of Outliers               | 0        | 0        |

**RESULTS OF ANALYSIS OF Am-241 DATA  
4th QUARTER 2005**

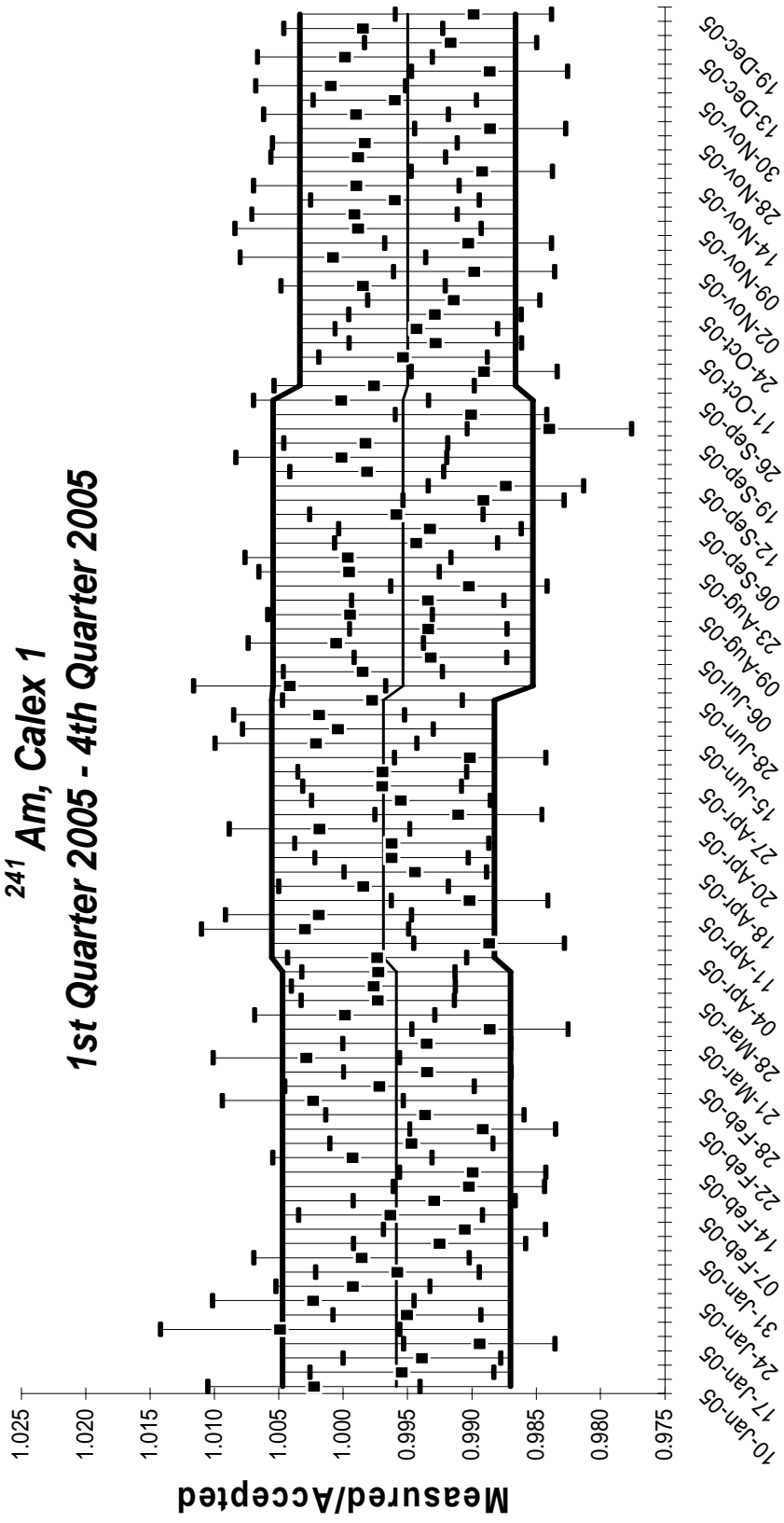
|                                  | Hanford Calex 1 | LLNL Calex 1 |
|----------------------------------|-----------------|--------------|
| Mean error (weight %)            | -0.0013%        | -0.0016%     |
| Standard deviation (weight %)    | 0.0011%         | 0.0010%      |
| certainty in the Mean (weight %) | 0.0002%         | 0.0004%      |
| Mean Error (%)                   | -0.50%          | -0.60%       |
| Standard Deviation (%)           | 0.43%           | 0.36%        |
| Uncertainty in the Mean (%)      | 0.08%           | 0.15%        |
| Number of Data Points            | 27              | 6            |
| Number of Outliers               | 0               | 0            |

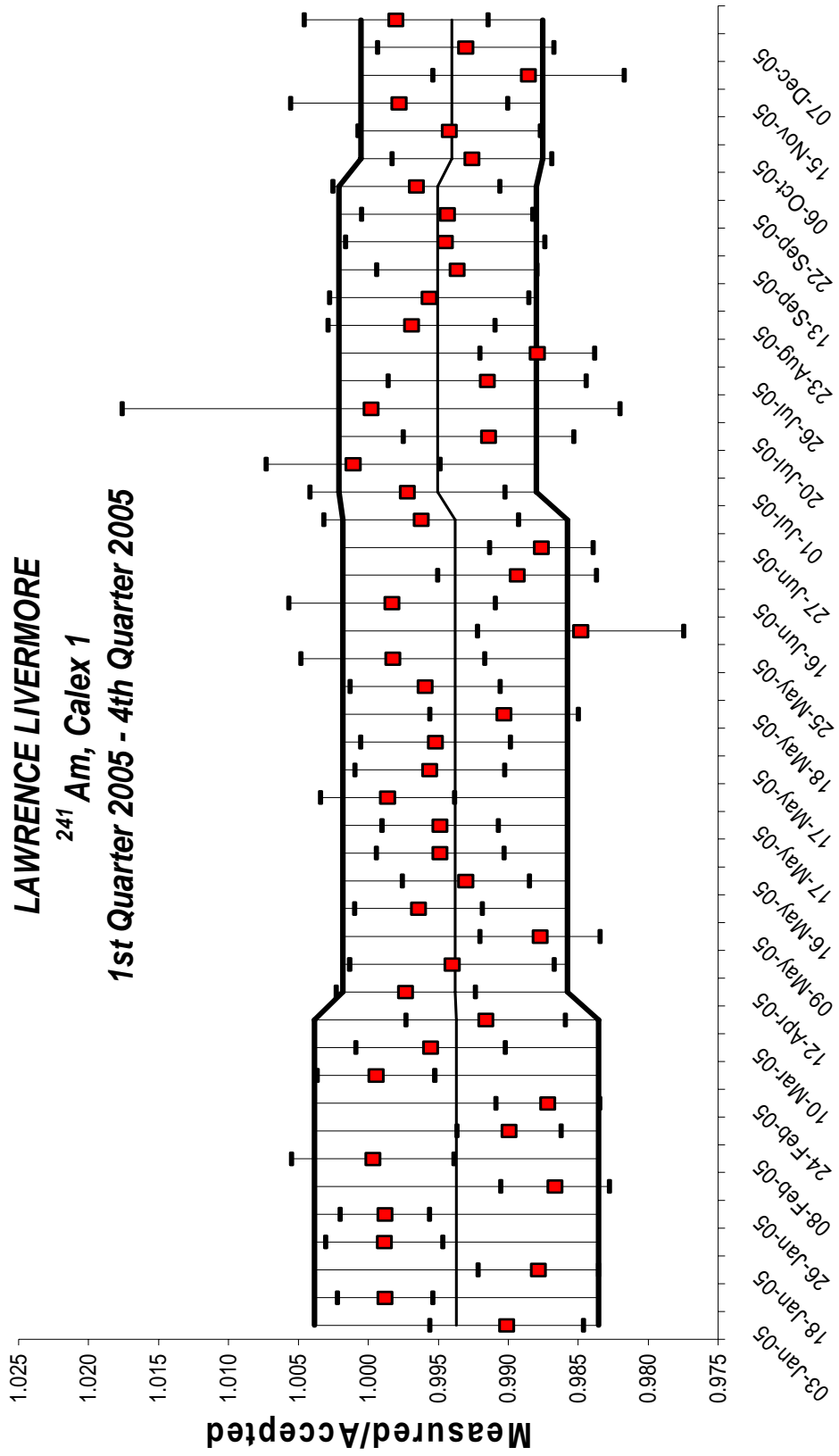
**Difference from Last Quarter in:**

|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | -0.0001% | -0.0003% |
| Standard deviation (weight %)    | -0.0003% | 0.0000%  |
| certainty in the Mean (weight %) | -0.0001% | 0.0001%  |
| Mean Error (%)                   | -0.04%   | -0.10%   |
| Standard Deviation (%)           | -0.09%   | -0.01%   |
| Uncertainty in the Mean (%)      | -0.03%   | 0.04%    |
| Number of Data Points            | 6        | -6       |
| Number of Outliers               | 0        | 0        |



**HANFORD**  
**241 Am, Calex 1**  
**1st Quarter 2005 - 4th Quarter 2005**





**RESULTS OF ANALYSIS OF Am-241 DATA  
2005**

|                                  | Hanford Calex 1 | LLNL Calex 1 |
|----------------------------------|-----------------|--------------|
| Mean error (weight %)            | -0.0011%        | -0.0016%     |
| Standard deviation (weight %)    | 0.0013%         | 0.0011%      |
| certainty in the Mean (weight %) | 0.0001%         | 0.0002%      |
| Mean Error (%)                   | -0.43%          | -0.59%       |
| Standard Deviation (%)           | 0.46%           | 0.42%        |
| Uncertainty in the Mean (%)      | 0.05%           | 0.06%        |
| Number of Data Points            | 97              | 48           |
| Number of Outliers               | 0               | 0            |

**Difference from Last Year in:**

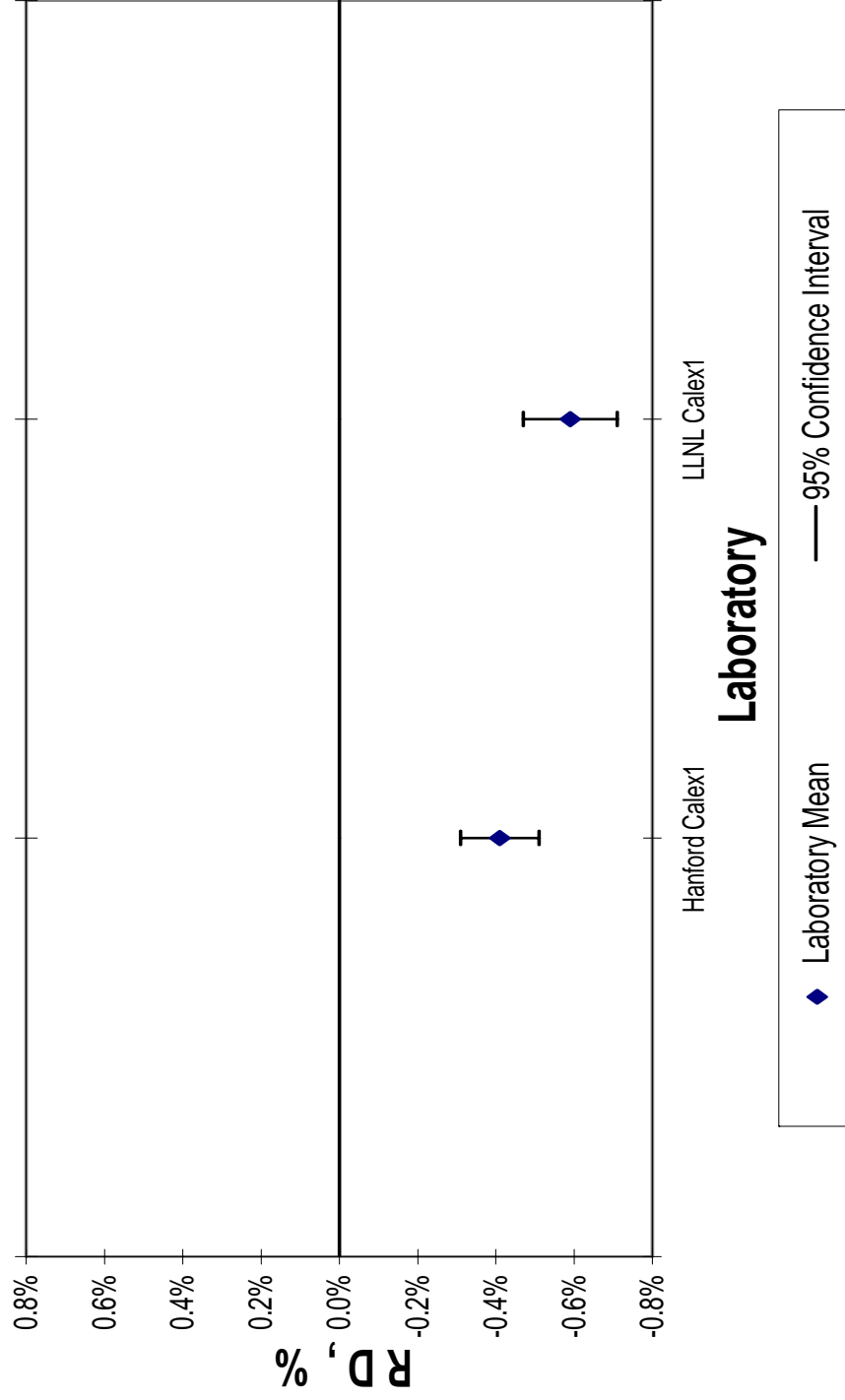
|                                  |          |          |
|----------------------------------|----------|----------|
| Mean error (weight %)            | 0.0001%  | 0.0006%  |
| Standard deviation (weight %)    | -0.0002% | -0.0001% |
| certainty in the Mean (weight %) | 0.0000%  | 0.0001%  |
| Mean Error (%)                   | 0.04%    | 0.25%    |
| Standard Deviation (%)           | -0.10%   | -0.04%   |
| Uncertainty in the Mean (%)      | 0.00%    | 0.01%    |
| Number of Data Points            | -50      | -28      |
| Number of Outliers               | -1       | 0        |

# New Brunswick Laboratory Calorimetry Exchange Program

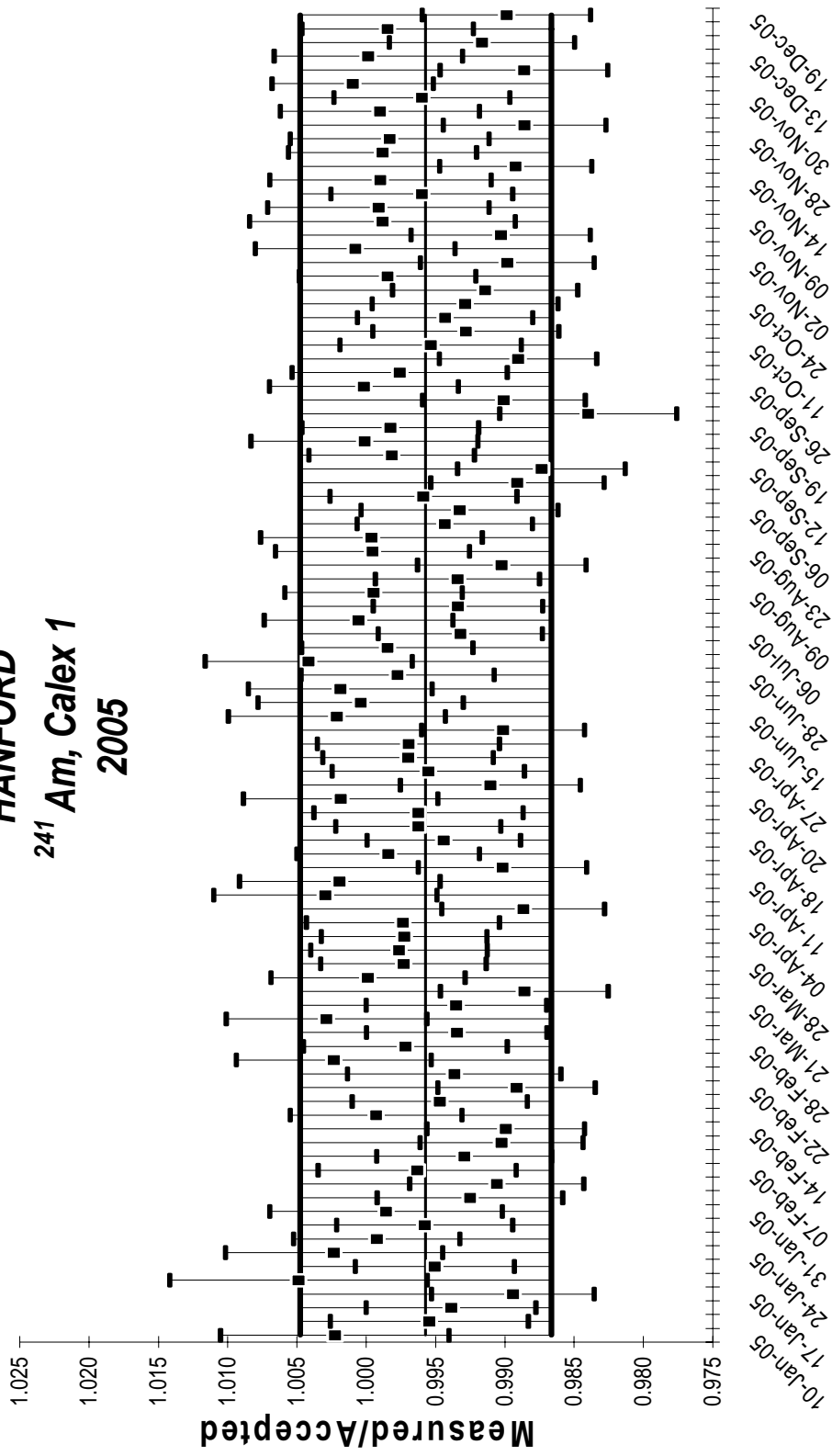
## Percent $^{241}\text{Am}$ , 2005

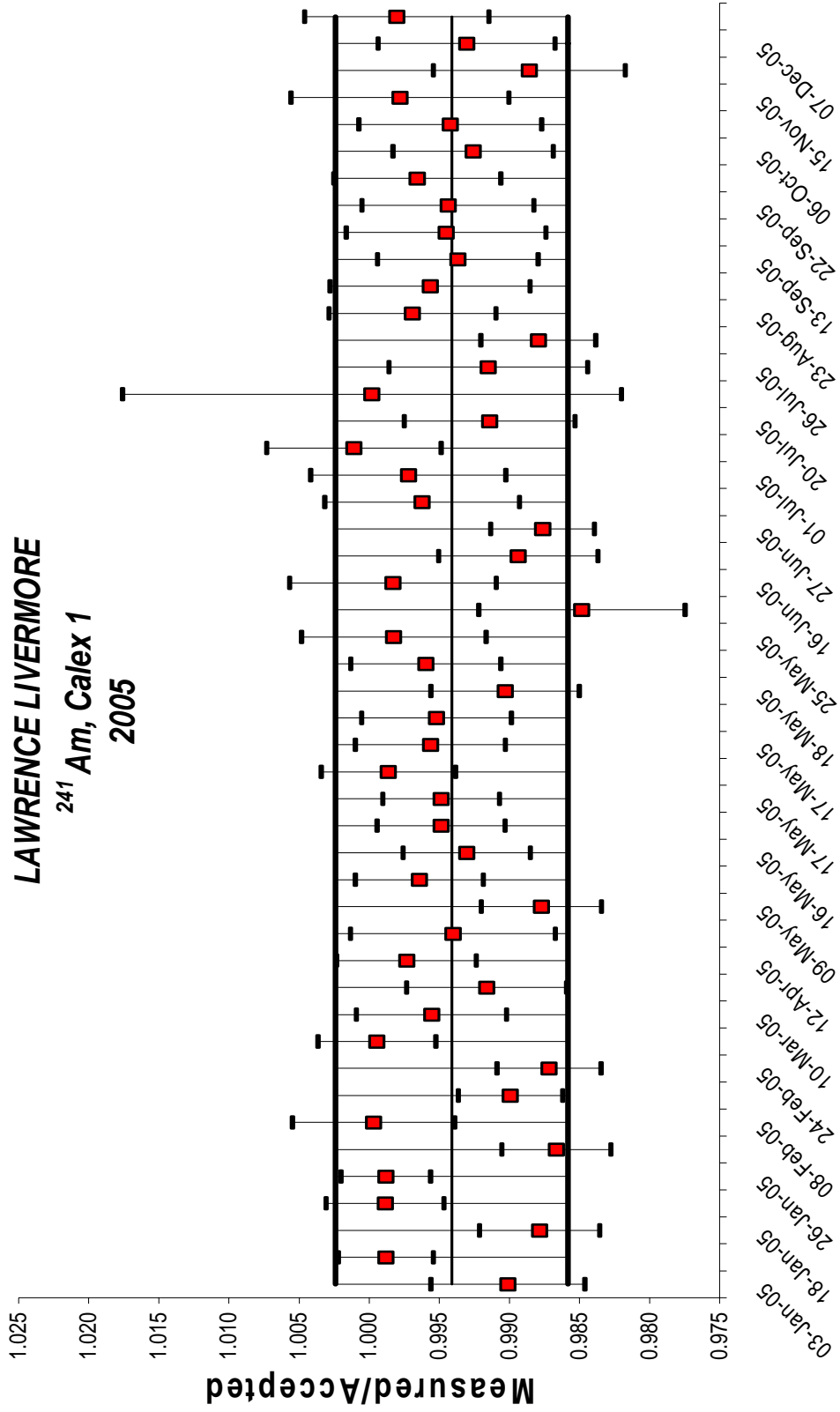
N=97

N=48



**HANFORD**  
**<sup>241</sup>Am, Calex 1**  
**2005**





**WEIGHT PERCENT 241-Am DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #  | Date Measured | Instr. ID | 241-Am  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|----|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|
| 1  | 10-Jan-05     | 2424      | 0.2645% | 0.41%         | 0.2639%           | 1.0023    | 0.0006%        | 0.23%         |
| 2  | 10-Jan-05     | 2026      | 0.2627% | 0.36%         | 0.2639%           | 0.9954    | -0.0012%       | -0.46%        |
| 3  | 11-Jan-05     | 2740      | 0.2623% | 0.31%         | 0.2639%           | 0.9939    | -0.0016%       | -0.61%        |
| 4  | 17-Jan-05     | 2740      | 0.2612% | 0.30%         | 0.2640%           | 0.9894    | -0.0028%       | -1.06%        |
| 5  | 18-Jan-05     | 2424      | 0.2653% | 0.46%         | 0.2640%           | 1.0049    | 0.0013%        | 0.49%         |
| 6  | 18-Jan-05     | 2026      | 0.2627% | 0.29%         | 0.2640%           | 0.9950    | -0.0013%       | -0.50%        |
| 7  | 24-Jan-05     | 2424      | 0.2647% | 0.39%         | 0.2641%           | 1.0023    | 0.0006%        | 0.23%         |
| 8  | 25-Jan-05     | 2026      | 0.2639% | 0.30%         | 0.2641%           | 0.9992    | -0.0002%       | -0.08%        |
| 9  | 26-Jan-05     | 2740      | 0.2630% | 0.32%         | 0.2641%           | 0.9958    | -0.0011%       | -0.42%        |
| 10 | 31-Jan-05     | 2424      | 0.2638% | 0.42%         | 0.2642%           | 0.9986    | -0.0004%       | -0.14%        |
| 11 | 31-Jan-05     | 2026      | 0.2622% | 0.34%         | 0.2642%           | 0.9925    | -0.0020%       | -0.75%        |
| 12 | 01-Feb-05     | 2740      | 0.2617% | 0.32%         | 0.2642%           | 0.9906    | -0.0025%       | -0.94%        |
| 13 | 07-Feb-05     | 2424      | 0.2633% | 0.36%         | 0.2643%           | 0.9963    | -0.0010%       | -0.37%        |
| 14 | 07-Feb-05     | 2026      | 0.2624% | 0.32%         | 0.2643%           | 0.9929    | -0.0019%       | -0.71%        |
| 15 | 08-Feb-05     | 2740      | 0.2617% | 0.30%         | 0.2643%           | 0.9902    | -0.0026%       | -0.98%        |
| 16 | 14-Feb-05     | 2740      | 0.2617% | 0.29%         | 0.2644%           | 0.9899    | -0.0027%       | -1.01%        |
| 17 | 16-Feb-05     | 2424      | 0.2642% | 0.31%         | 0.2644%           | 0.9993    | -0.0002%       | -0.07%        |
| 18 | 17-Feb-05     | 2026      | 0.2630% | 0.32%         | 0.2644%           | 0.9947    | -0.0014%       | -0.53%        |
| 19 | 22-Feb-05     | 2740      | 0.2616% | 0.29%         | 0.2645%           | 0.9891    | -0.0029%       | -1.09%        |
| 20 | 23-Feb-05     | 2424      | 0.2628% | 0.39%         | 0.2645%           | 0.9936    | -0.0017%       | -0.64%        |
| 21 | 23-Feb-05     | 2026      | 0.2651% | 0.35%         | 0.2645%           | 1.0023    | 0.0006%        | 0.23%         |
| 22 | 28-Feb-05     | 2424      | 0.2638% | 0.37%         | 0.2645%           | 0.9972    | -0.0007%       | -0.28%        |
| 23 | 14-Mar-05     | 2740      | 0.2630% | 0.33%         | 0.2647%           | 0.9935    | -0.0017%       | -0.65%        |
| 24 | 15-Mar-05     | 2424      | 0.2655% | 0.36%         | 0.2647%           | 1.0029    | 0.0008%        | 0.29%         |
| 25 | 21-Mar-05     | 2026      | 0.2631% | 0.33%         | 0.2648%           | 0.9935    | -0.0017%       | -0.65%        |
| 26 | 21-Mar-05     | 2740      | 0.2618% | 0.31%         | 0.2648%           | 0.9886    | -0.0030%       | -1.14%        |
| 27 | 22-Mar-05     | 2424      | 0.2648% | 0.35%         | 0.2648%           | 0.9999    | 0.0000%        | -0.01%        |
| 28 | 28-Mar-05     | 2026      | 0.2642% | 0.30%         | 0.2649%           | 0.9973    | -0.0007%       | -0.27%        |
| 29 | 29-Mar-05     | 2424      | 0.2643% | 0.32%         | 0.2649%           | 0.9976    | -0.0006%       | -0.24%        |
| 30 | 29-Mar-05     | 2740      | 0.2642% | 0.30%         | 0.2649%           | 0.9973    | -0.0007%       | -0.27%        |
| 31 | 04-Apr-05     | 2026      | 0.2643% | 0.35%         | 0.2650%           | 0.9973    | -0.0007%       | -0.27%        |
| 32 | 04-Apr-05     | 2740      | 0.2620% | 0.30%         | 0.2650%           | 0.9887    | -0.0030%       | -1.13%        |
| 33 | 05-Apr-05     | 2424      | 0.2658% | 0.40%         | 0.2650%           | 1.0029    | 0.0008%        | 0.29%         |
| 34 | 11-Apr-05     | 2026      | 0.2656% | 0.36%         | 0.2651%           | 1.0019    | 0.0005%        | 0.19%         |
| 35 | 12-Apr-05     | 2740      | 0.2625% | 0.31%         | 0.2651%           | 0.9902    | -0.0026%       | -0.98%        |
| 36 | 13-Apr-05     | 2424      | 0.2647% | 0.33%         | 0.2651%           | 0.9984    | -0.0004%       | -0.16%        |
| 37 | 18-Apr-05     | 2740      | 0.2637% | 0.28%         | 0.2652%           | 0.9944    | -0.0015%       | -0.56%        |
| 38 | 19-Apr-05     | 2026      | 0.2642% | 0.30%         | 0.2652%           | 0.9962    | -0.0010%       | -0.38%        |
| 39 | 19-Apr-05     | 2424      | 0.2642% | 0.38%         | 0.2652%           | 0.9962    | -0.0010%       | -0.38%        |
| 40 | 20-Apr-05     | 2424      | 0.2657% | 0.35%         | 0.2652%           | 1.0018    | 0.0005%        | 0.18%         |
| 41 | 25-Apr-05     | 2740      | 0.2629% | 0.33%         | 0.2653%           | 0.9910    | 0.0025%        | 0.90%         |
| 42 | 26-Apr-05     | 2424      | 0.2641% | 0.35%         | 0.2653%           | 0.9955    | -0.0012%       | -0.45%        |
| 43 | 27-Apr-05     | 2026      | 0.2645% | 0.31%         | 0.2653%           | 0.9970    | -0.0008%       | -0.30%        |
| 44 | 13-Jun-05     | 2026      | 0.2651% | 0.33%         | 0.2659%           | 0.9969    | -0.0008%       | -0.31%        |
| 45 | 14-Jun-05     | 2740      | 0.2633% | 0.30%         | 0.2659%           | 0.9901    | -0.0026%       | -0.99%        |
| 46 | 15-Jun-05     | 2424      | 0.2665% | 0.39%         | 0.2659%           | 1.0021    | 0.0006%        | 0.21%         |
| 47 | 27-Jun-05     | 2424      | 0.2662% | 0.37%         | 0.2661%           | 1.0004    | 0.0001%        | 0.04%         |
| 48 | 28-Jun-05     | 2026      | 0.2666% | 0.33%         | 0.2661%           | 1.0019    | 0.0005%        | 0.19%         |
| 49 | 28-Jun-05     | 2740      | 0.2655% | 0.35%         | 0.2661%           | 0.9977    | -0.0006%       | -0.23%        |
| 50 | 05-Jul-05     | 2424      | 0.2673% | 0.37%         | 0.2662%           | 1.0041    | 0.0011%        | 0.41%         |

**WEIGHT PERCENT 241-Am DATA**  
**Calendar Year 2005**

**HANFORD: Calex 1**

| #                   | Date Measured | Instr. ID | 241-Am  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |
|---------------------|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|
| 51                  | 06-Jul-05     | 2026      | 0.2658% | 0.31%         | 0.2662%           | 0.9985    | -0.0004%       | -0.15%        |
| 52                  | 06-Jul-05     | 2740      | 0.2644% | 0.30%         | 0.2662%           | 0.9932    | -0.0018%       | -0.68%        |
| 53                  | 25-Jul-05     | 2424      | 0.2666% | 0.34%         | 0.2665%           | 1.0005    | 0.0001%        | 0.05%         |
| 54                  | 26-Jul-05     | 2026      | 0.2647% | 0.31%         | 0.2665%           | 0.9934    | -0.0018%       | -0.66%        |
| 55                  | 09-Aug-05     | 2026      | 0.2665% | 0.32%         | 0.2666%           | 0.9995    | -0.0001%       | -0.05%        |
| 56                  | 10-Aug-05     | 2740      | 0.2649% | 0.30%         | 0.2667%           | 0.9934    | -0.0018%       | -0.66%        |
| 57                  | 22-Aug-05     | 2740      | 0.2642% | 0.31%         | 0.2668%           | 0.9902    | -0.0026%       | -0.98%        |
| 58                  | 23-Aug-05     | 2026      | 0.2667% | 0.35%         | 0.2668%           | 0.9995    | -0.0001%       | -0.05%        |
| 59                  | 29-Aug-05     | 2424      | 0.2668% | 0.40%         | 0.2669%           | 0.9996    | -0.0001%       | -0.04%        |
| 60                  | 30-Aug-05     | 2026      | 0.2654% | 0.32%         | 0.2669%           | 0.9943    | -0.0015%       | -0.57%        |
| 61                  | 06-Sep-05     | 2424      | 0.2652% | 0.36%         | 0.2670%           | 0.9932    | -0.0018%       | -0.68%        |
| 62                  | 06-Sep-05     | 2026      | 0.2659% | 0.34%         | 0.2670%           | 0.9959    | -0.0011%       | -0.41%        |
| 63                  | 07-Sep-05     | 2740      | 0.2641% | 0.32%         | 0.2670%           | 0.9891    | -0.0029%       | -1.09%        |
| 64                  | 12-Sep-05     | 2740      | 0.2637% | 0.31%         | 0.2671%           | 0.9873    | -0.0034%       | -1.27%        |
| 65                  | 13-Sep-05     | 2026      | 0.2666% | 0.30%         | 0.2671%           | 0.9982    | -0.0005%       | -0.18%        |
| 66                  | 19-Sep-05     | 2424      | 0.2672% | 0.41%         | 0.2672%           | 1.0001    | 0.0000%        | 0.01%         |
| 67                  | 19-Sep-05     | 2026      | 0.2667% | 0.32%         | 0.2672%           | 0.9982    | -0.0005%       | -0.18%        |
| 68                  | 20-Sep-05     | 2740      | 0.2629% | 0.33%         | 0.2672%           | 0.9840    | -0.0043%       | -1.60%        |
| 69                  | 26-Sep-05     | 2740      | 0.2646% | 0.30%         | 0.2673%           | 0.9901    | -0.0027%       | -0.99%        |
| 70                  | 26-Sep-05     | 2026      | 0.2673% | 0.34%         | 0.2673%           | 1.0002    | 0.0000%        | 0.02%         |
| 71                  | 03-Oct-05     | 2424      | 0.2667% | 0.39%         | 0.2673%           | 0.9976    | -0.0006%       | -0.24%        |
| 72                  | 10-Oct-05     | 2740      | 0.2645% | 0.29%         | 0.2674%           | 0.9890    | -0.0029%       | -1.10%        |
| 73                  | 11-Oct-05     | 2026      | 0.2662% | 0.33%         | 0.2674%           | 0.9953    | -0.0012%       | -0.47%        |
| 74                  | 17-Oct-05     | 2026      | 0.2656% | 0.34%         | 0.2675%           | 0.9928    | -0.0019%       | -0.72%        |
| 75                  | 17-Oct-05     | 2740      | 0.2660% | 0.32%         | 0.2675%           | 0.9943    | -0.0015%       | -0.57%        |
| 76                  | 24-Oct-05     | 2740      | 0.2657% | 0.34%         | 0.2676%           | 0.9929    | -0.0019%       | -0.71%        |
| 77                  | 31-Oct-05     | 2740      | 0.2654% | 0.34%         | 0.2677%           | 0.9914    | -0.0023%       | -0.86%        |
| 78                  | 01-Nov-05     | 2026      | 0.2673% | 0.32%         | 0.2677%           | 0.9985    | -0.0004%       | -0.15%        |
| 79                  | 02-Nov-05     | 2740      | 0.2650% | 0.32%         | 0.2677%           | 0.9898    | -0.0027%       | -1.02%        |
| 80                  | 07-Nov-05     | 2026      | 0.2680% | 0.36%         | 0.2678%           | 1.0008    | 0.0002%        | 0.08%         |
| 81                  | 08-Nov-05     | 2740      | 0.2652% | 0.33%         | 0.2678%           | 0.9903    | -0.0026%       | -0.97%        |
| 82                  | 09-Nov-05     | 2347      | 0.2675% | 0.48%         | 0.2678%           | 0.9988    | -0.0003%       | -0.12%        |
| 83                  | 11-Nov-05     | 2347      | 0.2676% | 0.40%         | 0.2678%           | 0.9991    | -0.0002%       | -0.09%        |
| 84                  | 14-Nov-05     | 2026      | 0.2668% | 0.33%         | 0.2679%           | 0.9960    | -0.0011%       | -0.40%        |
| 85                  | 14-Nov-05     | 2347      | 0.2676% | 0.40%         | 0.2679%           | 0.9990    | -0.0003%       | -0.10%        |
| 86                  | 15-Nov-05     | 2740      | 0.2650% | 0.28%         | 0.2679%           | 0.9892    | -0.0029%       | -1.08%        |
| 87                  | 17-Nov-05     | 2347      | 0.2676% | 0.34%         | 0.2679%           | 0.9988    | -0.0003%       | -0.12%        |
| 88                  | 28-Nov-05     | 2026      | 0.2676% | 0.36%         | 0.2681%           | 0.9983    | -0.0005%       | -0.17%        |
| 89                  | 29-Nov-05     | 2740      | 0.2650% | 0.30%         | 0.2681%           | 0.9886    | -0.0031%       | -1.14%        |
| 90                  | 29-Nov-05     | 2347      | 0.2678% | 0.36%         | 0.2681%           | 0.9990    | -0.0003%       | -0.10%        |
| 91                  | 30-Nov-05     | 2347      | 0.2670% | 0.32%         | 0.2681%           | 0.9960    | -0.0011%       | -0.40%        |
| 92                  | 05-Dec-05     | 2026      | 0.2684% | 0.29%         | 0.2681%           | 1.0010    | 0.0003%        | 0.10%         |
| 93                  | 06-Dec-05     | 2740      | 0.2651% | 0.31%         | 0.2682%           | 0.9886    | -0.0031%       | -1.14%        |
| 94                  | 13-Dec-05     | 2026      | 0.2682% | 0.34%         | 0.2682%           | 0.9998    | 0.0000%        | -0.02%        |
| 95                  | 13-Dec-05     | 2740      | 0.2660% | 0.34%         | 0.2682%           | 0.9916    | -0.0022%       | -0.84%        |
| 96                  | 19-Dec-05     | 2026      | 0.2679% | 0.31%         | 0.2683%           | 0.9984    | -0.0004%       | -0.16%        |
| 97                  | 19-Dec-05     | 2740      | 0.2656% | 0.31%         | 0.2683%           | 0.9899    | -0.0027%       | -1.01%        |
| Mean:               |               |           |         |               |                   | 0.9957    | -0.0011%       | -0.43%        |
| Standard Deviation: |               |           |         |               |                   | 0.0046    | 0.0013%        | 0.46%         |
| Standard Error:     |               |           |         |               |                   | 0.0005    | 0.0001%        | 0.05%         |



**WEIGHT PERCENT 241-Am DATA**  
**Calendar Year 2005**

**LLNL Calex 1**

| #                   | Date Measured | Instr. ID | 241-Am  | Uncert. 1 STD | Accepted Weight % | Ratio M/A | Weight % Error | Percent Error |        |
|---------------------|---------------|-----------|---------|---------------|-------------------|-----------|----------------|---------------|--------|
| 1                   | 03-Jan-05     | 3         | 0.2612% | 0.28%         | 0.2638%           | 0.9901    | -0.0026%       | -0.99%        |        |
| 2                   | 11-Jan-05     | 2         | 0.2636% | 0.17%         | 0.2639%           | 0.9988    | -0.0003%       | -0.12%        |        |
| 3                   | 18-Jan-05     | 3         | 0.2608% | 0.22%         | 0.2640%           | 0.9878    | -0.0032%       | -1.22%        |        |
| 4                   | 25-Jan-05     | 1         | 0.2638% | 0.21%         | 0.2641%           | 0.9989    | -0.0003%       | -0.11%        |        |
| 5                   | 26-Jan-05     | 2         | 0.2638% | 0.16%         | 0.2641%           | 0.9988    | -0.0003%       | -0.12%        |        |
| 6                   | 27-Jan-05     | 3         | 0.2606% | 0.20%         | 0.2641%           | 0.9866    | -0.0035%       | -1.34%        |        |
| 7                   | 08-Feb-05     | 2         | 0.2642% | 0.29%         | 0.2643%           | 0.9997    | -0.0001%       | -0.03%        |        |
| 8                   | 14-Feb-05     | 1         | 0.2617% | 0.19%         | 0.2644%           | 0.9899    | -0.0027%       | -1.01%        |        |
| 9                   | 24-Feb-05     | 3         | 0.2611% | 0.19%         | 0.2645%           | 0.9872    | -0.0034%       | -1.28%        |        |
| 10                  | 28-Feb-05     | 1         | 0.2644% | 0.21%         | 0.2645%           | 0.9994    | -0.0001%       | -0.06%        |        |
| 11                  | 10-Mar-05     | 2         | 0.2635% | 0.27%         | 0.2647%           | 0.9955    | -0.0012%       | -0.45%        |        |
| 12                  | 21-Mar-05     | 3         | 0.2626% | 0.29%         | 0.2648%           | 0.9916    | -0.0022%       | -0.84%        |        |
| 13                  | 12-Apr-05     | 1         | 0.2644% | 0.25%         | 0.2651%           | 0.9973    | -0.0007%       | -0.27%        |        |
| 14                  | 18-Apr-05     | 3         | 0.2636% | 0.37%         | 0.2652%           | 0.9940    | -0.0016%       | -0.60%        |        |
| 15                  | 09-May-05     | 3         | 0.2622% | 0.22%         | 0.2655%           | 0.9877    | -0.0033%       | -1.23%        |        |
| 16                  | 16-May-05     | 1         | 0.2646% | 0.23%         | 0.2656%           | 0.9964    | -0.0010%       | -0.36%        |        |
| 17                  | 16-May-05     | 1         | 0.2637% | 0.23%         | 0.2656%           | 0.9930    | -0.0019%       | -0.70%        |        |
| 18                  | 17-May-05     | 1         | 0.2642% | 0.23%         | 0.2656%           | 0.9949    | -0.0014%       | -0.51%        |        |
| 19                  | 17-May-05     | 1         | 0.2642% | 0.21%         | 0.2656%           | 0.9949    | -0.0014%       | -0.51%        |        |
| 20                  | 17-May-05     | 1         | 0.2652% | 0.24%         | 0.2656%           | 0.9986    | -0.0004%       | -0.14%        |        |
| 21                  | 17-May-05     | 1         | 0.2644% | 0.27%         | 0.2656%           | 0.9956    | -0.0012%       | -0.44%        |        |
| 22                  | 18-May-05     | 1         | 0.2643% | 0.27%         | 0.2656%           | 0.9952    | -0.0013%       | -0.48%        |        |
| 23                  | 18-May-05     | 1         | 0.2630% | 0.27%         | 0.2656%           | 0.9903    | -0.0026%       | -0.97%        |        |
| 24                  | 18-May-05     | 1         | 0.2645% | 0.27%         | 0.2656%           | 0.9959    | -0.0011%       | -0.41%        |        |
| 25                  | 25-May-05     | 3         | 0.2652% | 0.33%         | 0.2657%           | 0.9982    | -0.0005%       | -0.18%        |        |
| 26                  | 07-Jun-05     | 3         | 0.2618% | 0.38%         | 0.2658%           | 0.9848    | -0.0040%       | -1.52%        |        |
| 27                  | 16-Jun-05     | 1         | 0.2655% | 0.37%         | 0.2660%           | 0.9983    | -0.0005%       | -0.17%        |        |
| 28                  | 22-Jun-05     | 3         | 0.2632% | 0.29%         | 0.2660%           | 0.9894    | -0.0028%       | -1.06%        |        |
| 29                  | 27-Jun-05     | 3         | 0.2628% | 0.19%         | 0.2661%           | 0.9876    | -0.0033%       | -1.24%        |        |
| 30                  | 28-Jun-05     | 1         | 0.2651% | 0.35%         | 0.2661%           | 0.9962    | -0.0010%       | -0.38%        |        |
| 31                  | 01-Jul-05     | 1         | 0.2654% | 0.35%         | 0.2661%           | 0.9972    | -0.0007%       | -0.28%        |        |
| 32                  | 14-Jul-05     | 1         | 0.2666% | 0.31%         | 0.2663%           | 1.0011    | 0.0003%        | 0.11%         |        |
| 33                  | 20-Jul-05     | 3         | 0.2641% | 0.31%         | 0.2664%           | 0.9914    | -0.0023%       | -0.86%        |        |
| 34                  | 25-Jul-05     | 1         | 0.2664% | 0.89%         | 0.2665%           | 0.9998    | -0.0001%       | -0.02%        |        |
| 35                  | 26-Jul-05     | 3         | 0.2642% | 0.36%         | 0.2665%           | 0.9915    | -0.0023%       | -0.85%        |        |
| 36                  | 15-Aug-05     | 3         | 0.2635% | 0.21%         | 0.2667%           | 0.9879    | -0.0032%       | -1.21%        |        |
| 37                  | 23-Aug-05     | 1         | 0.2660% | 0.30%         | 0.2668%           | 0.9969    | -0.0008%       | -0.31%        |        |
| 38                  | 26-Aug-05     | 1         | 0.2657% | 0.36%         | 0.2669%           | 0.9956    | -0.0012%       | -0.44%        |        |
| 39                  | 13-Sep-05     | 1         | 0.2654% | 0.29%         | 0.2671%           | 0.9937    | -0.0017%       | -0.63%        |        |
| 40                  | 19-Sep-05     | 3         | 0.2657% | 0.36%         | 0.2672%           | 0.9945    | -0.0015%       | -0.55%        |        |
| 41                  | 22-Sep-05     | 2         | 0.2657% | 0.31%         | 0.2672%           | 0.9944    | -0.0015%       | -0.56%        |        |
| 42                  | 23-Sep-05     | 2         | 0.2663% | 0.30%         | 0.2672%           | 0.9966    | -0.0009%       | -0.34%        |        |
| 43                  | 06-Oct-05     | 3         | 0.2654% | 0.29%         | 0.2674%           | 0.9926    | -0.0020%       | -0.74%        |        |
| 44                  | 11-Oct-05     | 3         | 0.2659% | 0.33%         | 0.2674%           | 0.9942    | -0.0015%       | -0.58%        |        |
| 45                  | 15-Nov-05     | 1         | 0.2673% | 0.39%         | 0.2679%           | 0.9978    | -0.0006%       | -0.22%        |        |
| 46                  | 29-Nov-05     | 2         | 0.2650% | 0.35%         | 0.2681%           | 0.9886    | -0.0031%       | -1.14%        |        |
| 47                  | 07-Dec-05     | 2         | 0.2663% | 0.32%         | 0.2682%           | 0.9930    | -0.0019%       | -0.70%        |        |
| 48                  | 20-Dec-05     | 2         | 0.2678% | 0.33%         | 0.2683%           | 0.9980    | -0.0005%       | -0.20%        |        |
| Mean:               |               |           |         |               |                   |           | 0.9941         | -0.0016%      | -0.59% |
| Standard Deviation: |               |           |         |               |                   |           | 0.0042         | 0.0011%       | 0.42%  |
| Standard Error:     |               |           |         |               |                   |           | 0.0006         | 0.0002%       | 0.06%  |

