XUNDL Status Report:
(Oct. 1, 2004 – Sept. 30, 2005)

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Overview

- To provide prompt and convenient electronic access to current publications or preprints in experimental nuclear-structure data (level-scheme information) that are not yet available in the ENSDF database or in NDS.
- ENSDF-style datasets compiled from one paper, or a set of related papers from the same experimental group.
- Covering both high- and low-spin papers. Current literature on experimental nuclear structure seems equally divided between high-spin and low-spin publications, as judged by regular perusal of web pages of primary nuclear physics journals (PRL, PL-B, PR-C, NP-A, EPJ-A, JP-G)

Overview *cont.*

- Compilation work done primarily at McMaster (~93% contribution overall, ~100% during 2000-05).
- The entry of datasets in XUNDL database is coordinated by B. Singh at McMaster, while the organization/management of the database is handled by D.F. Winchell and T.W. Burrows at NNDC, BNL
- Requires a consistent level of effort in keeping up-to-date with the published literature, communication with original authors, and participation of undergraduate students

Current Contents of XUNDL

- Since the start in December 1998,
  1626 datasets added up to September 30, 2005
- Covers mainly high-spin structures; but since 2003, most low-spin papers have also been compiled.
- (It is estimated that the XUNDL database contains data from almost all the high-spin papers published from 1998-2005, and about 50% of the papers published from 1995-97.)
- ~1100 nuclides: ^{9}Be to ^{288}115, spread over ~225 A-chains
- Data from over 1200 primary references published mainly during 1995 – 2005

Work in FY-05

- 300 datasets compiled since October 1, 2004; which include data from about 100 papers published in 2005 alone.
- 15 existing datasets revised/updated based on new papers from previous authors/groups
- Most current low-spin papers have also been compiled
- Undergraduate student, Joel Roediger, actively participated in XUNDL work in 2004-2005
- Except for about 20 papers published in journal web pages in the last 3-4 weeks, we are current on the compilation of high- and low-spin publications

Undergraduate Student Participation

- Students trained in:
  - Basic nuclear physics and experimental techniques
  - Retrievals from ENSDF, XUNDL, NSR databases
  - ENSDF format and nuclear quantities involved
  - Use of semi-automatic translation codes
    (PDF to TEXT, TEXT to ENSDF)
  - Use of format and consistency checking codes
    (FMTCHK, PANDORA, ISOTOPE EXPLORER)
  - Use of calculation codes
    (GTOL, HSICC, LOGFT)

Compilation Methods

(same as described in USNDP-04 meeting)

- Commercial code Finereader used extensively to create tabular text files from PDF files in journal web pages
- TABULAR-TEXT to ENSDF conversion code, developed at McMaster, routinely used to generate draft ENSDF-formatted datasets
- Datasets run through codes such as FMTCHK and GTOL
- HSICC and LOGFT codes used for decay datasets
- Level schemes, bands and numerical data in the compiled dataset run through the ISOTOPE-EXPLORER code. Finally all data transcription checked manually.
- Data-related discrepancies/inconsistencies and requests for additional data details are resolved with original authors via e-mail communication

Communication with authors

- Authors of original papers frequently contacted to resolve data-related errors/inconsistencies, and/or to request additional details of data
- Generally, prompt and useful response received from the authors
- In some cases, based on such communications, errata have been published by the original authors.

Conclusions

- The current retrieval rate by the user community, as monitored by NNDC, is about 300/month from the NNDC site. There are other retrievals made through LBNL and RADWARE websites.

  The datasets in XUNDL are also being used by ENSDF evaluators in their A-chain/nuclide evaluation work

- Availability of compiled XUNDL datasets should potentially accelerate data-evaluation process, and turn around time of A-chain updates in ENSDF database

- Amongst the two databases, ENSDF and XUNDL, we believe that the experimentally known/published high-spin level structures are now almost fully covered and made conveniently available to the research/user community through NNDC's retrieval system, LBNL's Isotope Explorer and ORNL's Radware software