

CSEWG & USNDP, Meetings '2005

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Testing ENDF/B-VIIb1

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Testing of Neutron Sublibrary

Phase 1: **NJOY 99.90**

- **Compiler: Lahey Fortran 95**
- **Two small patches**
- **Single files: 387 evaluations**

Phase 2: **MCNP 5**

- **Simple test: GODIVA**
- **One small patch**

NJOY 99.90 Patches

1. LEGENDRE polynomials:

File **UP90**:

*ident **up15**

*d **heatr.3284**

dimension **cnw(*)**,p(**65**)

*ident **up30**

*d **up15.11**

*i **heatr.3298**

data **nlmax/65/**

NJOY 99.90 Patches

2. NEGATIVE PROBABILITIES:

```
*/ subroutine ptleg2
```

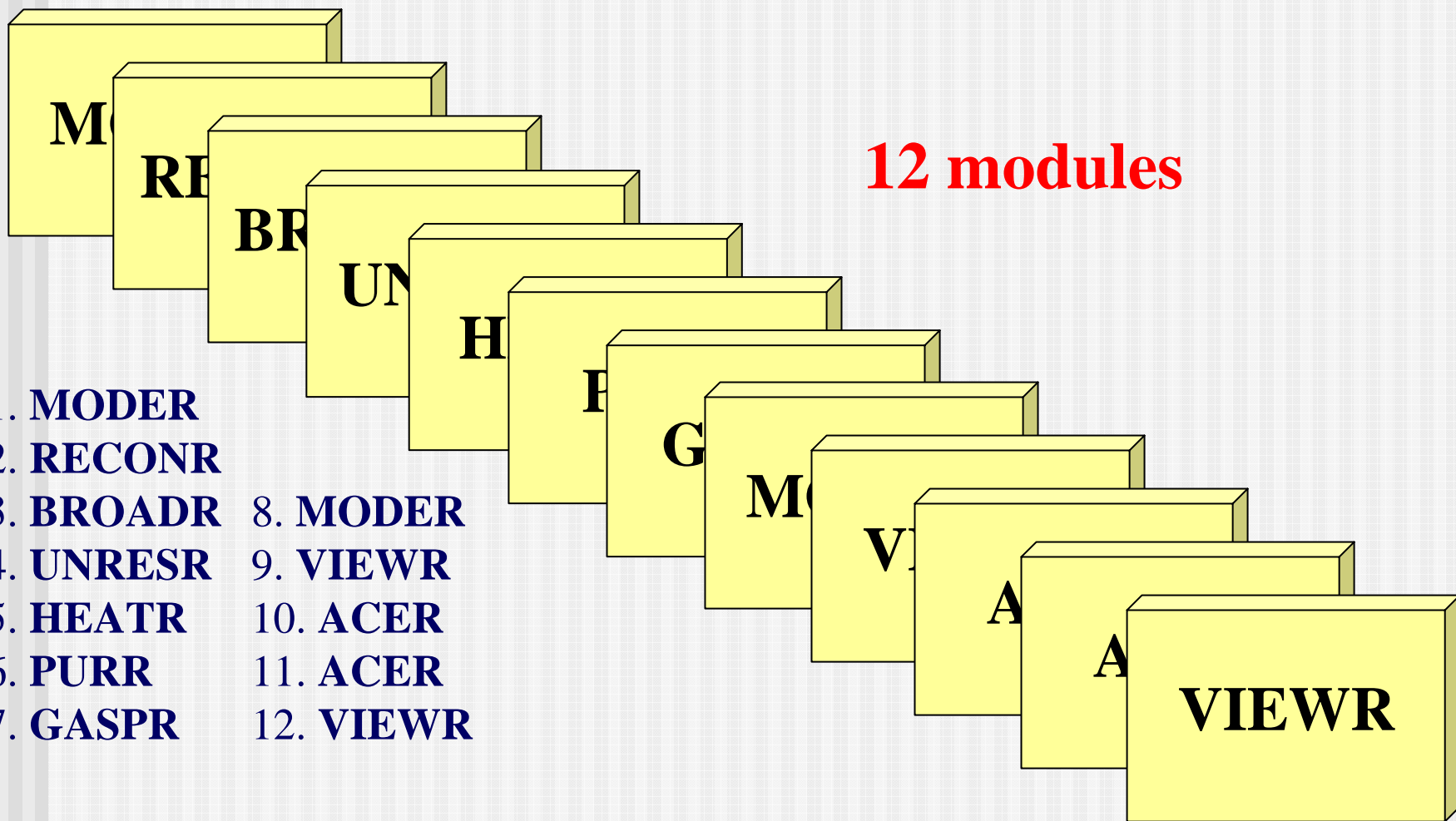
```
*d acer.6951
```

```
    dimension aco(3600), cprob(3600), cumm(3600)
```

```
*d acer.7031
```

```
    if (ii.gt.3600) call error('ptleg2','too many angles','')
```

Data Verification – NJOY 99.90



Data Verification – MCNP 5

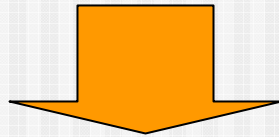
Criticality Calculation - **GODIVA**

3 materials were used:

- **U-235 94.889 %**
- **U-238 5.111 %**
- **Test material was added as impurity 0.001 %**

MCNP 5 Patch

Needed for: **Gd-155** and **Rh-103**



Subroutine **expung**

Line 15

```
integer, parameter :: m3 = 1500  
integer, parameter :: m4 = 200  
integer :: jx(27), m2(m3), jf(m4), nx(8)
```

Results

- **NJOY 99.90 + patches + ENDF/B-VIIb1 (387 files)**
 - **Success: 385 ACE files**
 - **Failure: no ACE files for H-1 & Th-232**
(special treatment needed)
- **GODIVA test: MCNP5+patch+385 ACE files**
 - **Success: 385 runs**

Feedback on ENDF/B-VII b1

1. **Kr-84**: Erroneous mat id in 3 lines - **corrected**
2. NJOY produces **TYR = 0** and **TYR = -19**
for **Am-242g, Am-242m, Cm-243, Cf-249** – **corrected**
by **completing MF=4**
3. Mismatch in MF2 energies: **Xe-126, In-113** - **corrected**
Eu-152 – **will be corrected**
4. **11 fission products**: Errors in MF1 MT451 index -
usually irrelevant - **will be corrected in beta 2**