

# Tripoli-4.4 pointwise library Production with NJOY99.90

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# TRIPOLI-4.4

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Monte Carlo code

TRIPOLI : TRIdimensional POLYkinetic

Four main classes of problems :

- Shielding studies
- Criticality studies
- Core physics studies
- Instrumentation
- Dosimetry

Particles:

- Neutrons
- Gamma
- electrons, positrons

# Nuclear Data

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Gamma :

Atomic data from **E**valuated **P**hoton **D**ata **L**ibrary

In the future : Photonuclear Data

Electrons, positrons :

**E**valuated **E**lectron **D**ata **L**ibrary

Neutrons :

All libraries in ENDF-6 Format

ENDFB6R8, ENDFB7, JEF2.2, JEFF3.1, JENDL3.3...

# Nuclear Data Libraries and Processing

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NJOY99.90 on SUN workstation

1. Reconstruction at 0 K (RECONR)
2. Doppler Broadening at T K (BROADR)
3. Treatment of Unresolved Range (UNRESR)

Free Gas thermalization is done within TRIPOLI4.4

4. Treatment of Thermal Neutron scattering data for materials (THERMR)

→ Pointwise cross section

Unresolved Range : Probability Tables (CALENDF)

# NJOY Inputs

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RECONR :

Fractional reconstruction tolerance  $err = 0.001$

BROADR :

Fractional tolerance for thinning  $errthn = 0.001$

UNRESR :

Infinity dilution

THERMR :

Modifications for 32 equi-probable cosines  
Tolerance = 0.001

# Tripoli4.4 Libraries

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TRIPOLI4.4 generates XDR portable binary and angular distribution files the first time it reads in a PENDF and an ENDF file

Five Files are used :

1. Evaluation (ascii)
2. Dictionary of cross sections (ascii file)\*
3. Binary XDR pointwise file\*
4. Anisotropy file (ascii file)\*
5. Probability tables

\*: generated at first use

Tests for evaluations :

ENDF-102 format

Normalization (angular and energetic distribution)

# TRIPOLI Libraries

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 TRIPOLI distribution now includes: JEF2.2 and ENDFB6R4 at 300 K

ENDFB6R8, JEFF3.1, JENDL3.3 very soon

Future distribution will includes : several libraries at 5-6 temperatures

# Processing results (problems)

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## JEF2.2:

Co58, Co58M, Na22, Sn112 and Zn64

No anisotropy data for (n,np) reaction (MT=28)

Bi209 and Pb

## ENDFB6R4 :

Au197, Ho165

Problems with anisotropy for inelastics scattering

In, In115

K41, Mg24, Ti46, Ti47, Ti48, Ti50

F19, Sm144

Mo92, Mo98, Mo100, Sn120, Sn122, Sn124

# Processing results (problems)

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## ENDFB6R8 :

Same nuclei as ENDFB6R4 except Sm144

## JEFF3.1 :

TRIPOLI was used to test pre - JEFF3.1

→ Pb isotopes, Bi209, Pu238...

Li7, Be9, F19, Ca46, V, Rh103, I127, I129, Ho165, Au165

## JENDL3.3:

H2 and Be9

# Benchmarks

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JEF/DOC-1084 : TRIPOLI4.4 & JEFF-3.1, ENDF/B-VII b0 and JENDL-3.3 With the ICSBEP Criticality Models

JEF/DOC-1044 : TRIPOLI4.3 Benchmarks

JEF/DOC-1034 : ICSBEP JEFF-3.1T  
Benchmarkings : preliminary results

<http://mcavignon2005.cea.fr/>