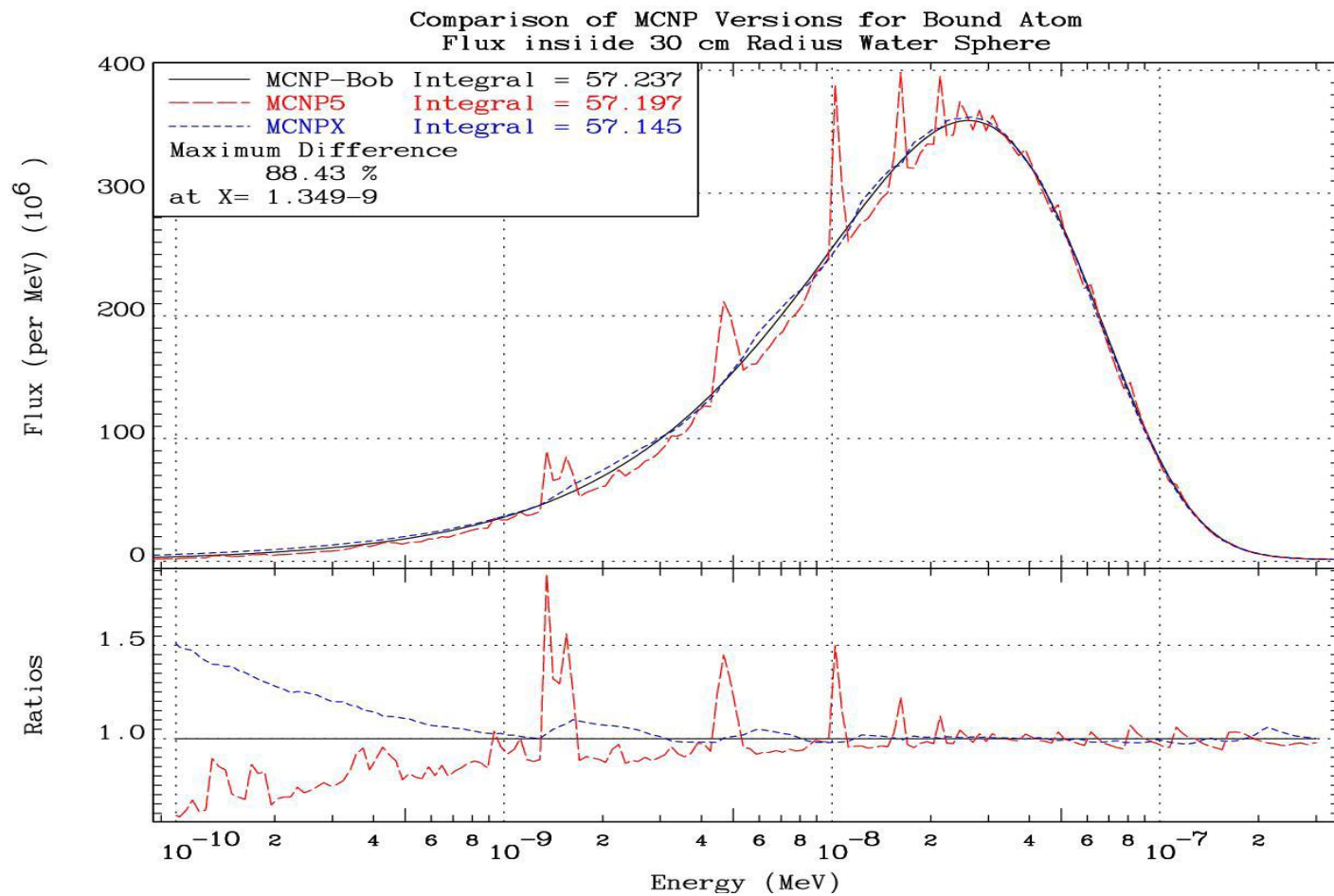


Normalisation of Interpolated Secondary Energy Distributions for Thermal Scattering

Christopher Dean and Ray Perry

Presented by
Christopher Dean

NJOY UPDATE 99.252

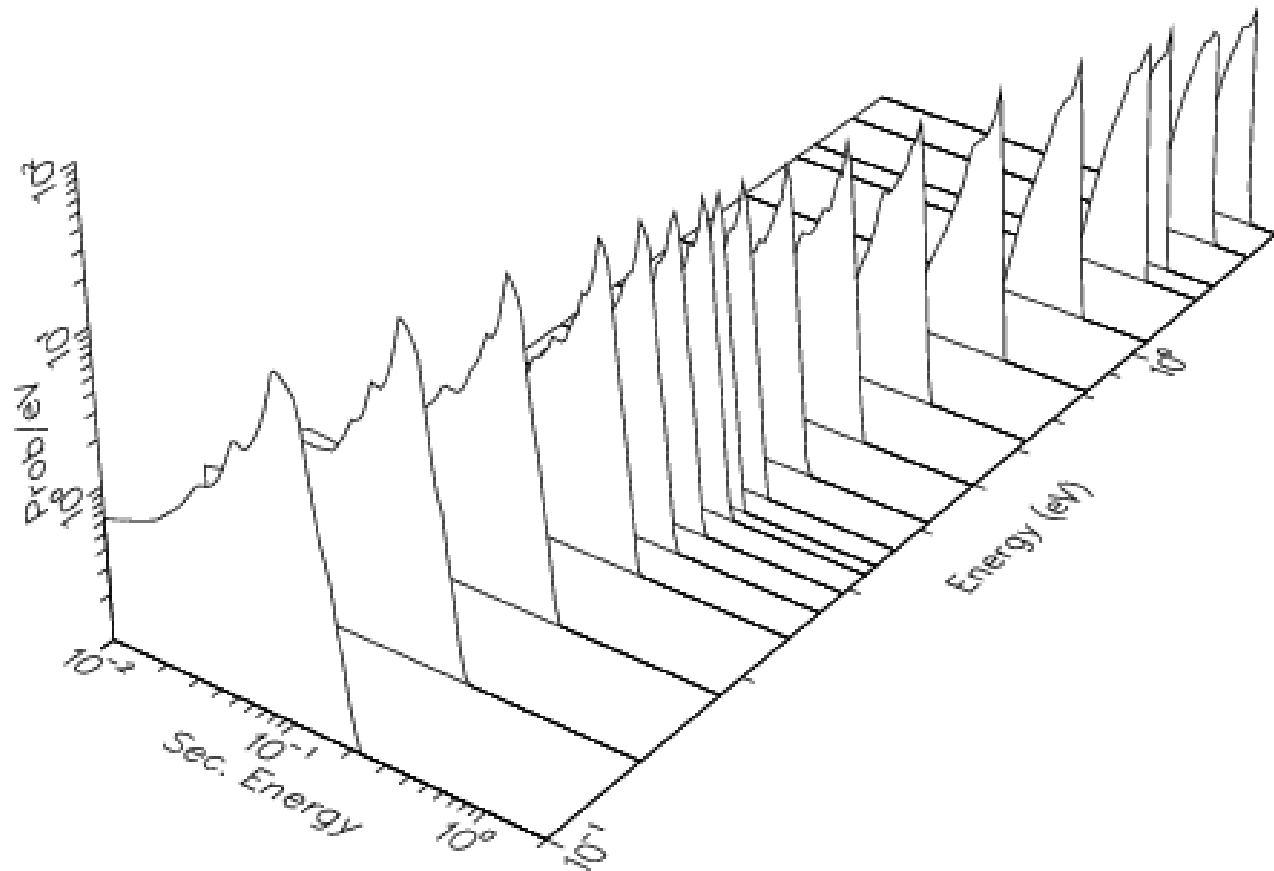


- **NJOY-99.252 - new thermal processing**
- **Sublet and MacFarlane – JEFF/DOC-1203**
- **Modification in Thermr and Acer**
- **Secondary Energy distributions are generated on an Incident energy grid.**
- Incident Energy in THERMR increased to 117 carefully chosen points
- Changes to MCNP sampling + representation by 32 equi-probable bins

Problem in Results from GROUPR

- Scatter matrix did not add to cross section
- Background
- Solution defined.
- Changes in GROUPR

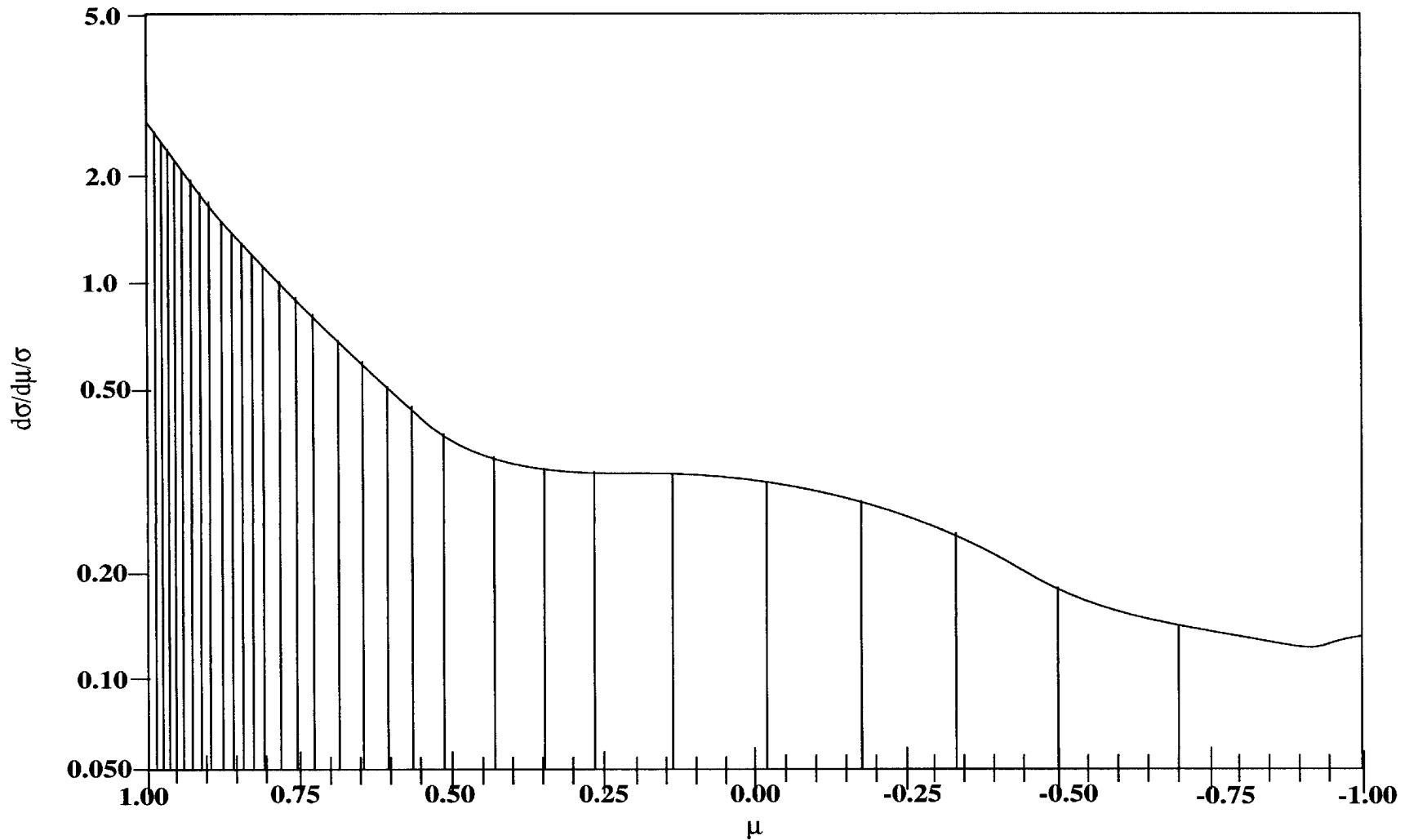
Background Picture Page VII-8 of NJOY Manual



Background

- Peaked energy distributions
- Grid in THERMR has to be defined before group structure is known
- 117 points adequate for Monte Carlo.
- Interpolation from these to Energy grid required by GROUPT i.e. group bounds + cross section grid + flux grid
- Integration of 3D function
- Representation of each distribution
 - a) Consider Equi-probable BINS

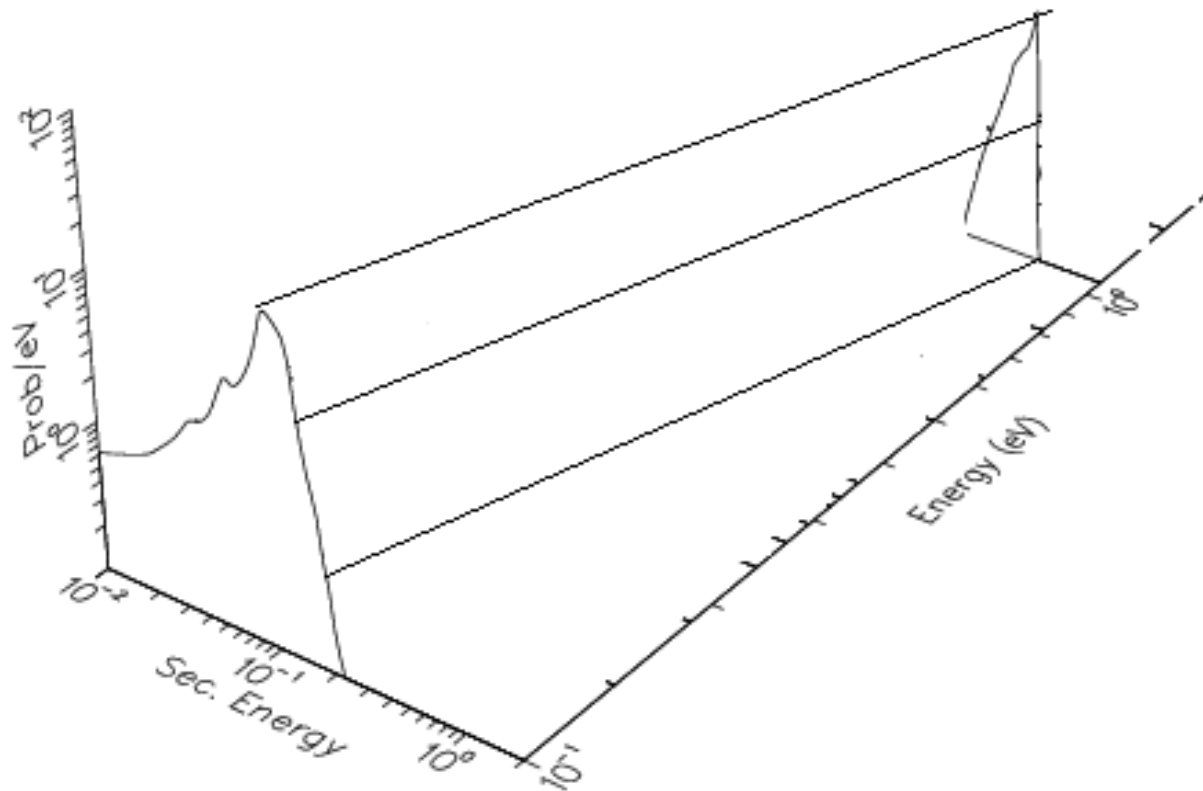
Background Equi- Probable Bins



Background

- Adequate for smooth functions.
- Good for interpolation
- Join equi- probable bin boundaries at different incident energies – same number of bins.
- **Preserves Area below integral**
- Poor representation of peaked distributions
- R MacFarlane –Improved representation of important peaks
- Energy loss proportional at different incident energies
- **Join peaks and work outwards**

Background Joining Peaks and working out from the peak



Solution Defined –adaption of Mac Farlane's Method

- Join Peaks and work outwards
- Then use equi-probable bins for the rest of the distribution
- Achieves the same number of points in adjoining distributions
- Allows interpolation and integration
- **DOES NOT PRESERVE INTEGRAL OF DISTRIBUTION AT INTERPOLATED POINTS**
- **Fix GROUPE to Preserve integral**

Changes in GROUPR

- Changes to subroutine GETAED of GROUPR
- Update named UPWE6
- Made available to A Trkov for consideration with some other Winfrith changes.
- Comments in the updates to explain the suggested improvement.