Benchmark Analyses of Ti JEFF-3.1T Data for Fusion Applications

U. Fischer, I. Schmuck, S. P. Simakov

Association FZK-Euratom
Forschungszentrum Karlsruhe

EFF/EAF Monitoring Meeting, NEA Data Bank, Paris, May 2-5, 2005

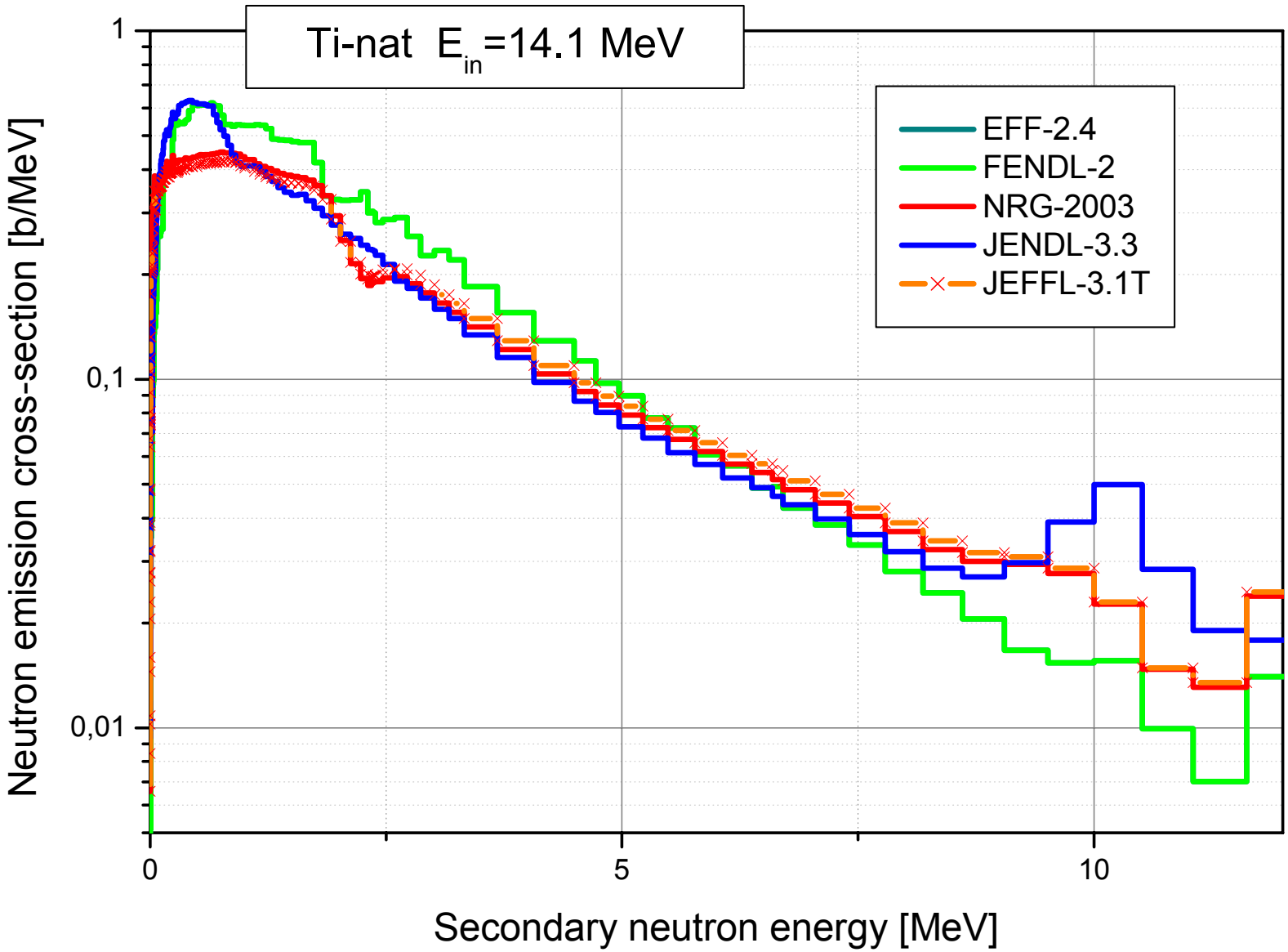
Ti Data Evaluations

Data library	Evaluations	Origin
ENDF/B-VI	Ti-nat	ENDF/B-V
EFF-2.4	Ti-nat	JENDL-3.0
FENDL-1,2	Ti-nat	JENDL-3.2
JENDL-3.3	^{46,47,48,49,50}Ti	JENDL-FF + new
NRG-2003	^{46,47,48,49,50}Ti	NRG(TALYS)
JEFF-3.1T	^{46,47,48,49,50}Ti	NRG-2003/IRK

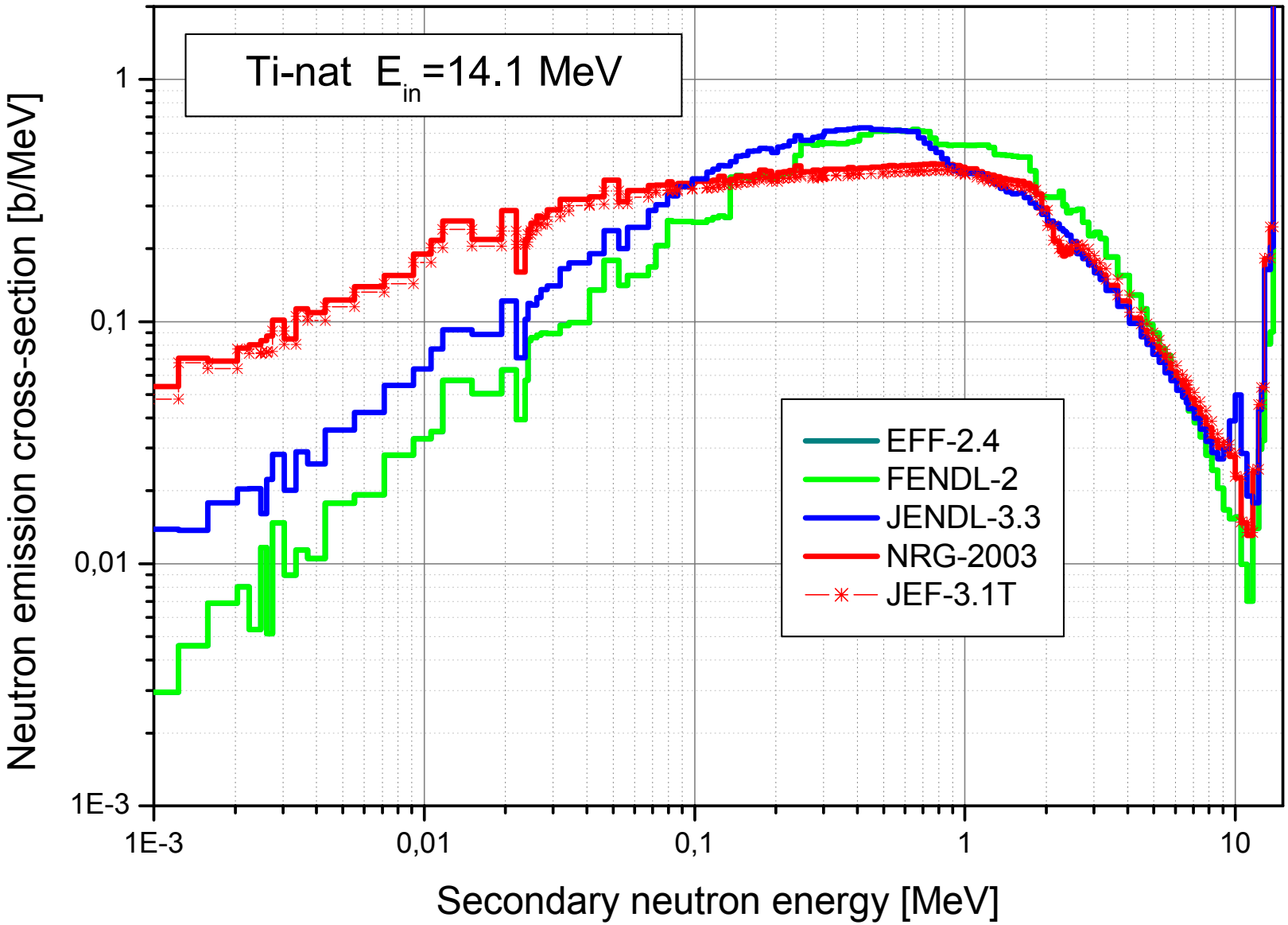
Methodology

- Processing of ENDF data files (NJOY/ACER)
- Comparison of ACE cross-section data
  - EFF-2.4, FENDL-2, JENDL-3.3, NRG-2003, JEFF-3.1T
  - $\sigma_{nem}(E_{in}=14.1\ MeV, E')$
- Benchmark calculations (MCNP + ACE data)
  - OKTAVIAN Ti sphere assembly
    - (Ø 40 cm, 9.55 cm eff. thickness)
  - Neutron leakage spectra
    - Comparison of data evaluations
    - Comparison to experimental results

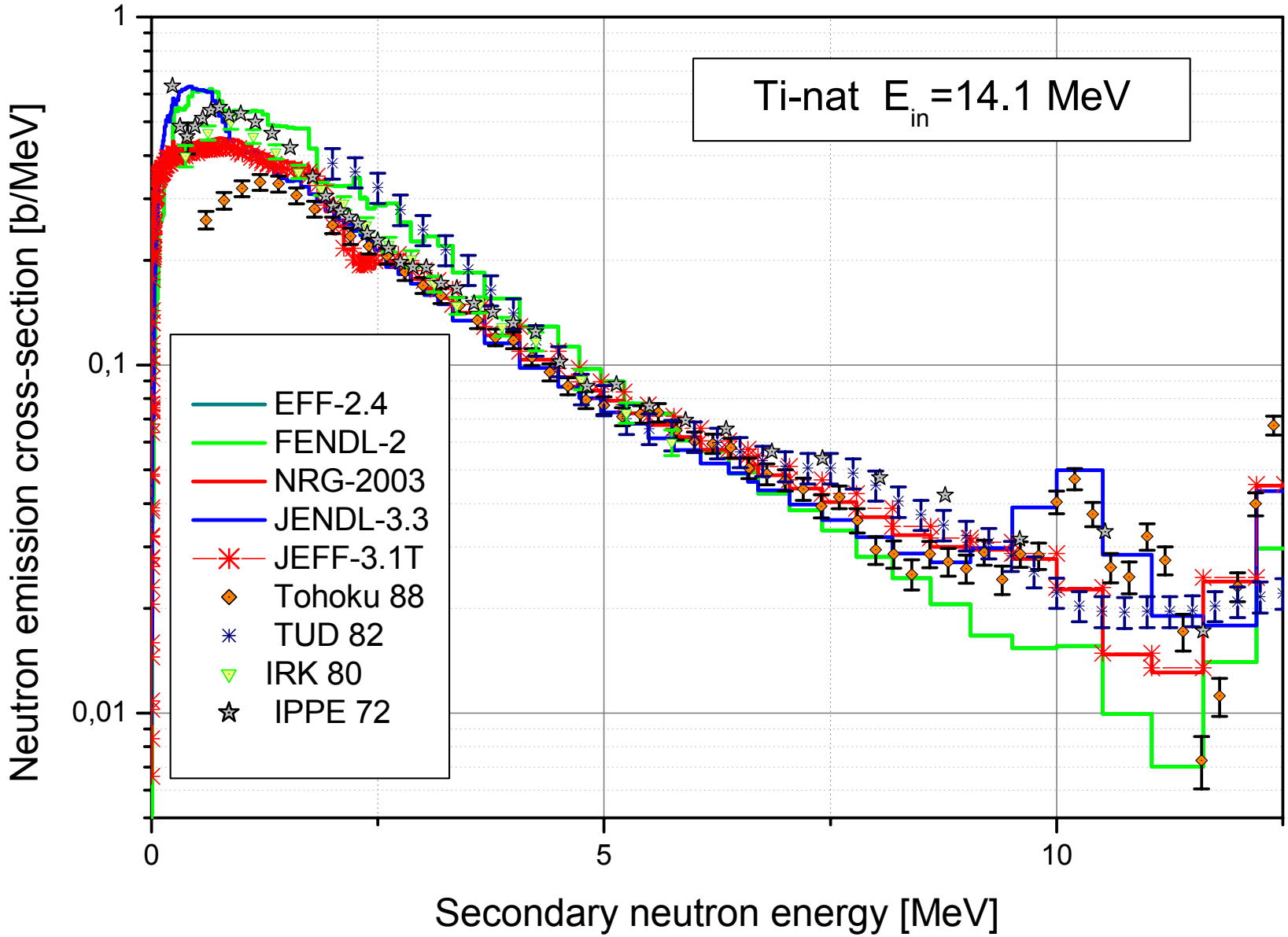
Neutron Emission Cross-Sections



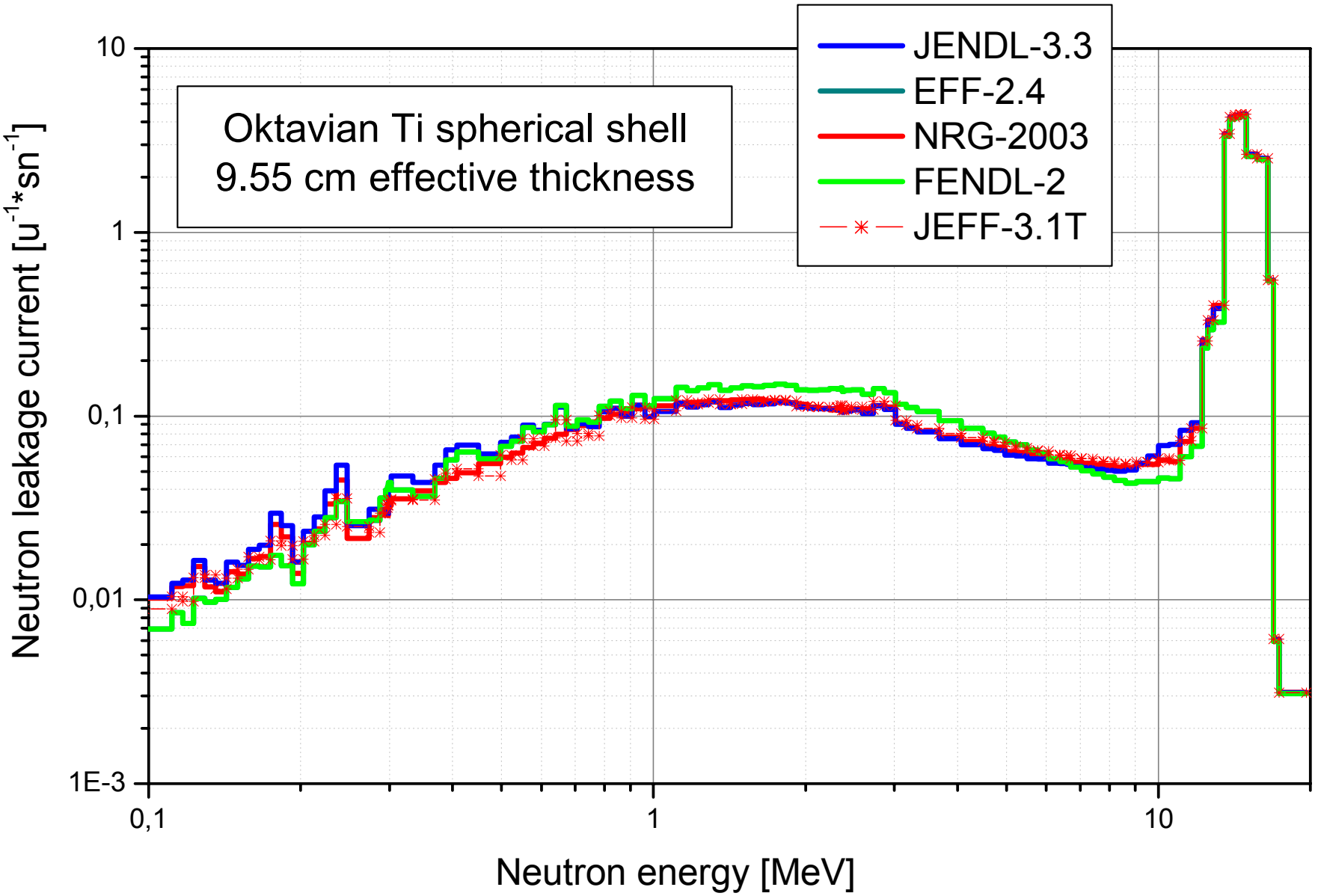
Neutron Emission Cross-Sections



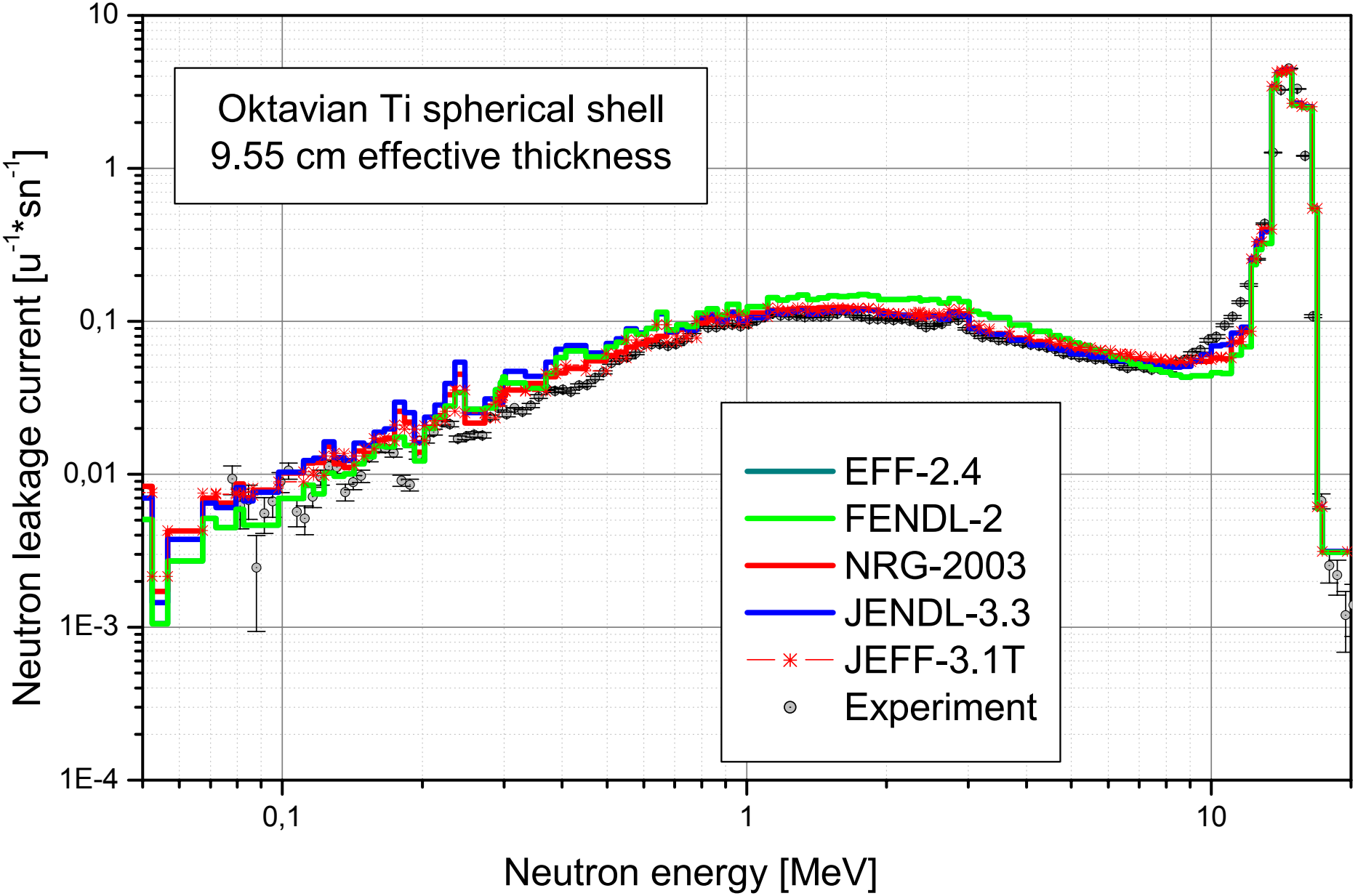
Neutron Emission Cross-Sections



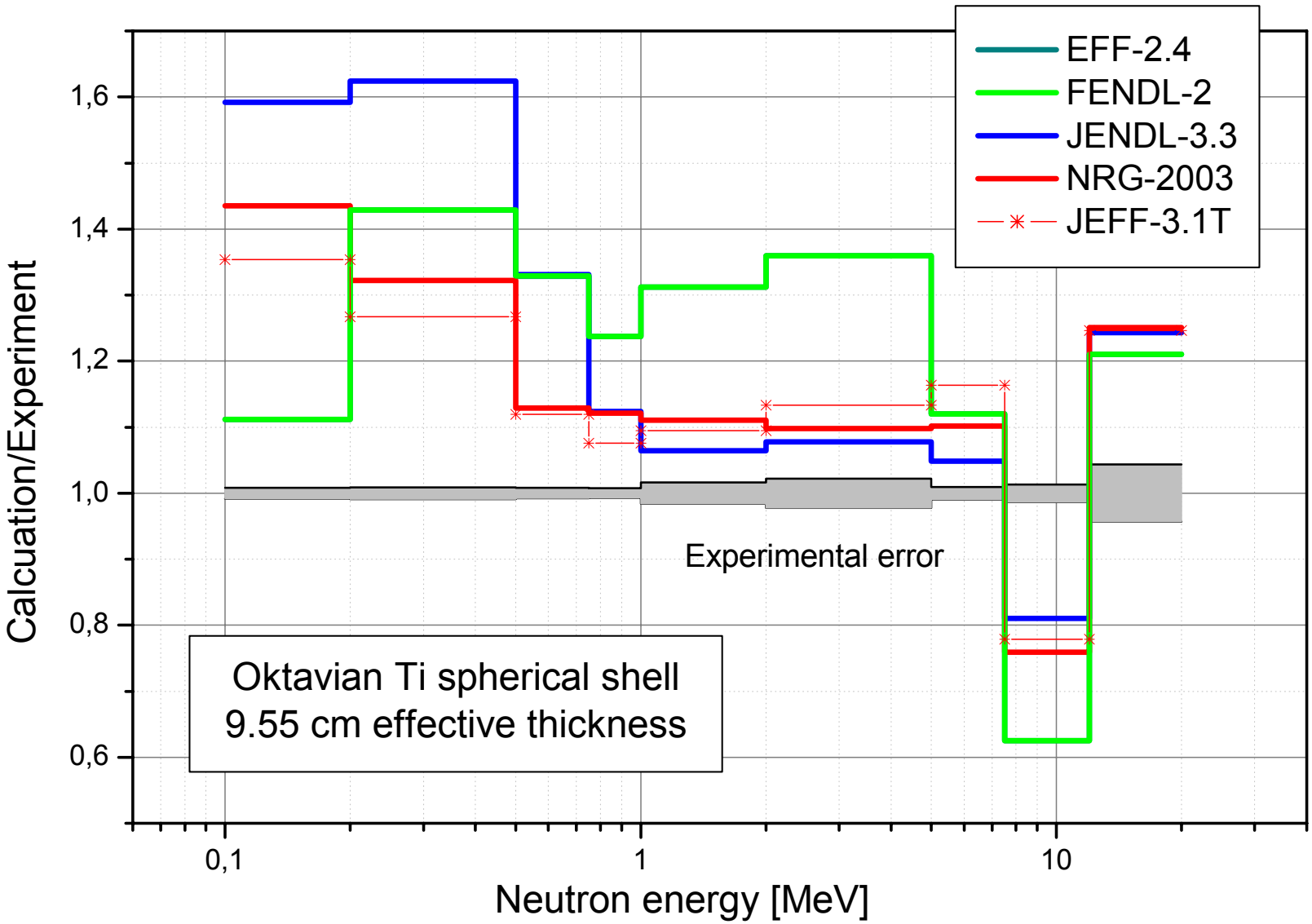
Neutron Leakage Spectra



Neutron Leakage Spectra



Neutron Flux Integrals: C/E Comparison



Conclusions

- JEFF-3.1T essentially agrees with NRG-2003
  - Neutron emission cross-sections
  - Benchmark results
- Neutron emission spectra (14 MeV)
  - Unphysical jump still present
  - Pronounced differences among available (recent) Ti data evaluations
- Agreement with OKTAVIAN experiment not satisfactory