

Experimental Benchmarking of FENDL-2.1 with Impact of ENDF/B-VII.0 Data

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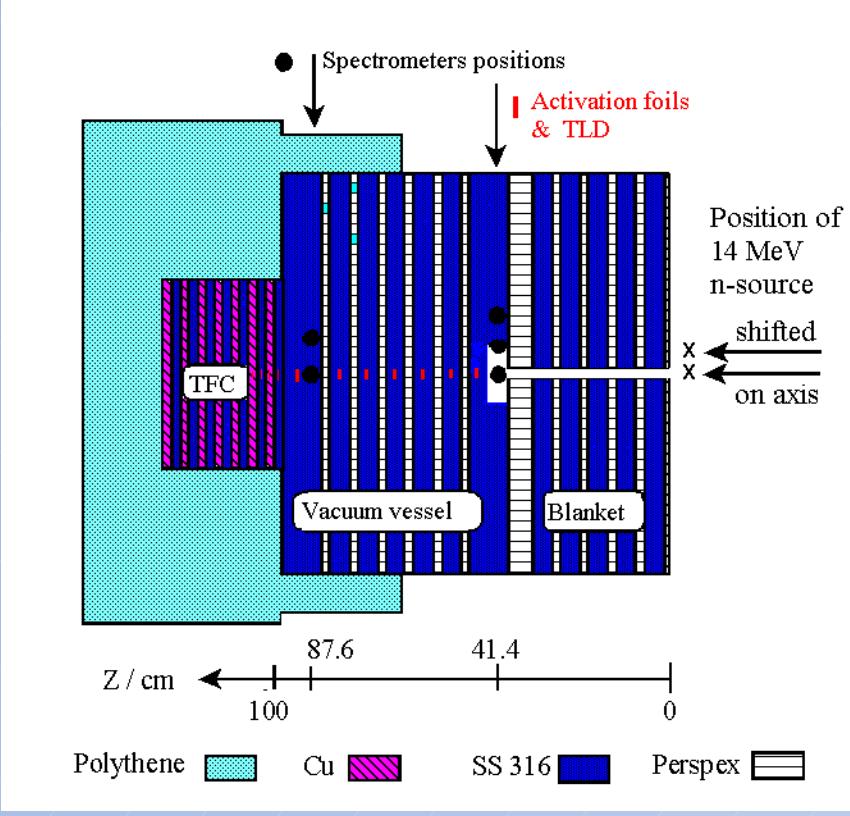
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Introduction

- The IAEA has developed the Fusion Evaluated Nuclear Data Library (FENDL)
- FENDL-2.1 has 40 of its 71 isotopes taken from ENDF/B-VI.8
- ENDF/B-VII.0 has been recently released (Dec. 2006)
- Want to examine the effect of new data using four fusion specific experimental benchmarks (ITER relevant)
- Experiments performed at the 14.1 MeV Fusion Neutron Generator facility at ENEA Frascati Research Center
- Compare experimental results to detailed calculations using MCNPX v2.6f
- Calculations use FENDL-2.1, ENDF/B-VII, and a modified FENDL-2.1 where the 40 isotopes from ENDF/B-VI.8 are replaced with ENDF/B-VII.0

FNG Benchmark Experiments

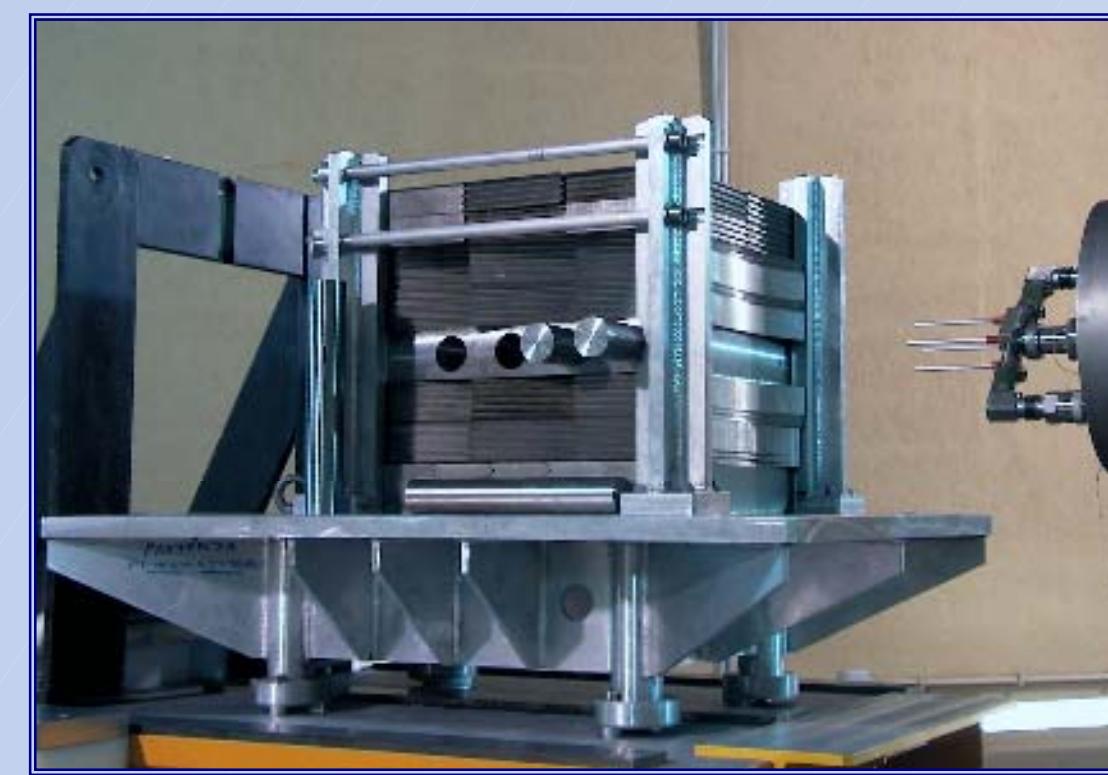
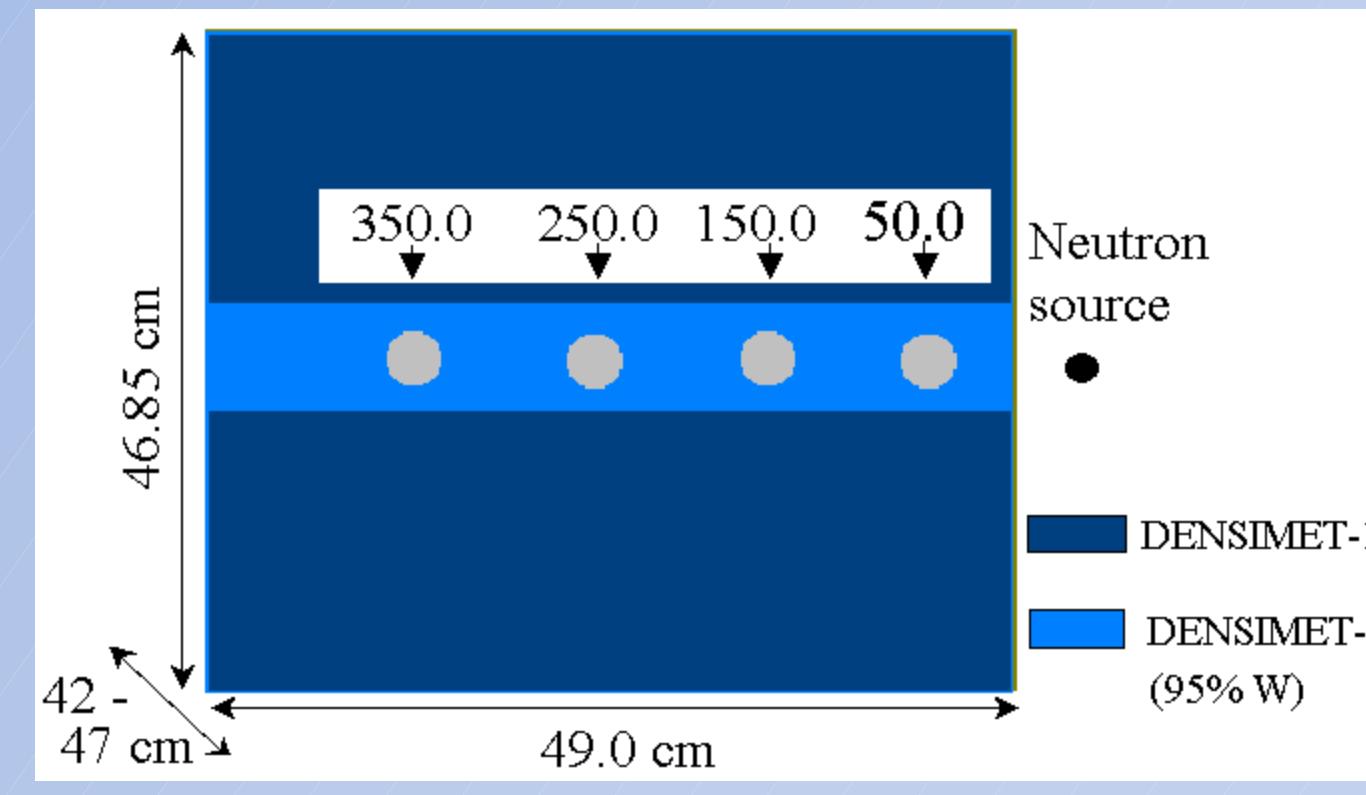
Streaming experiment



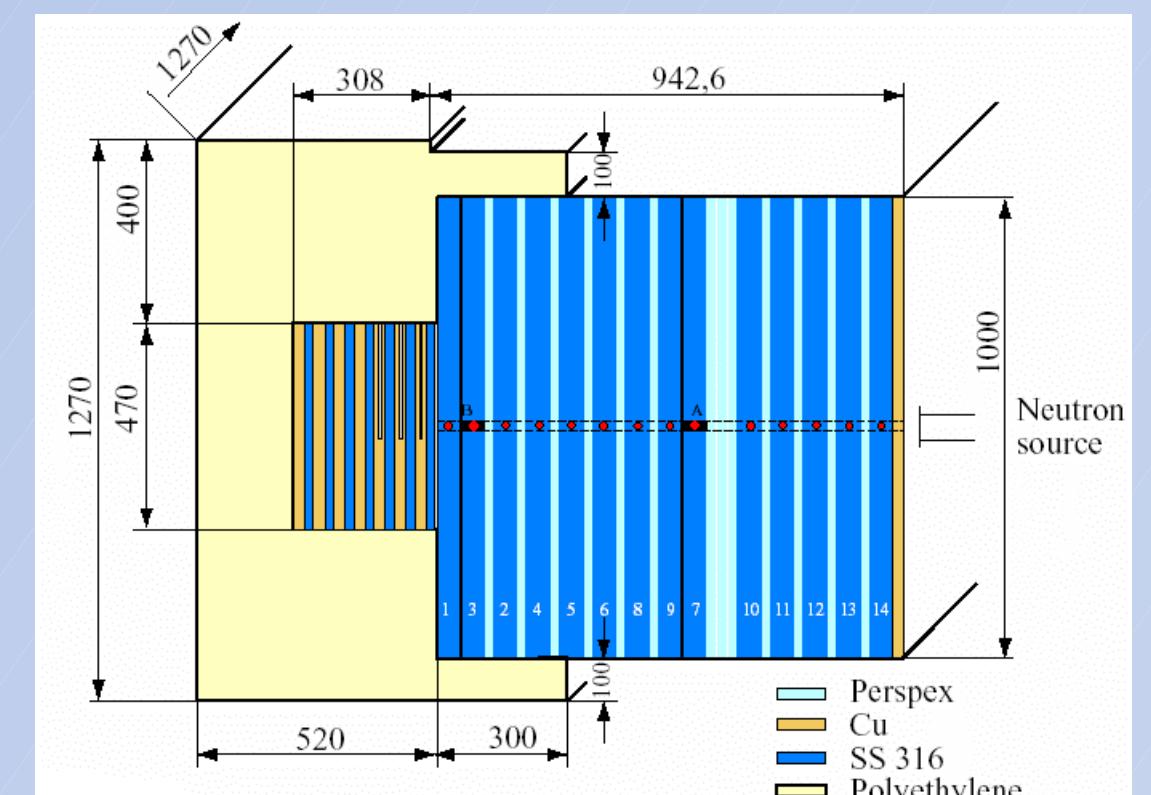
FNG 14.1 MeV Source



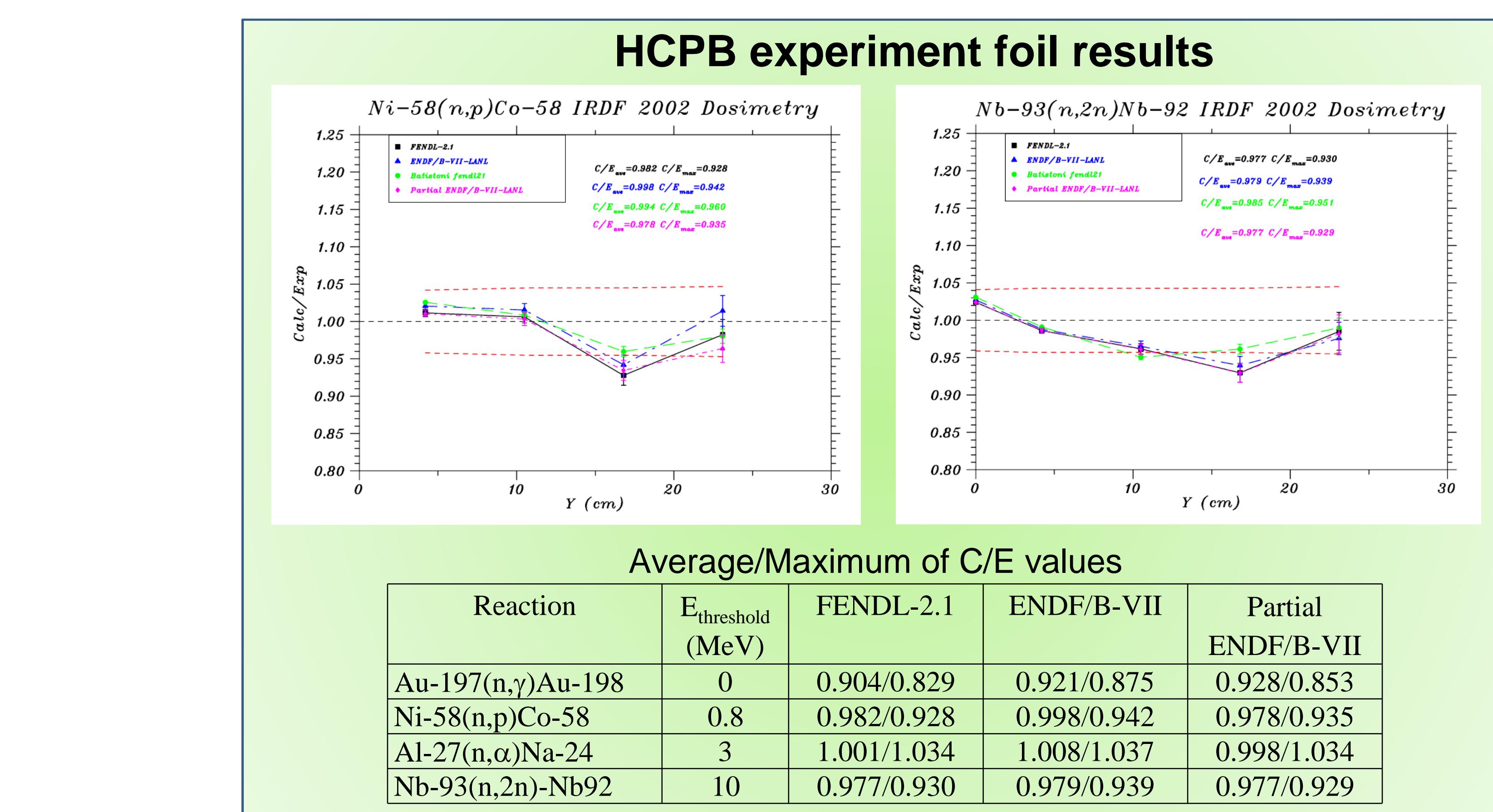
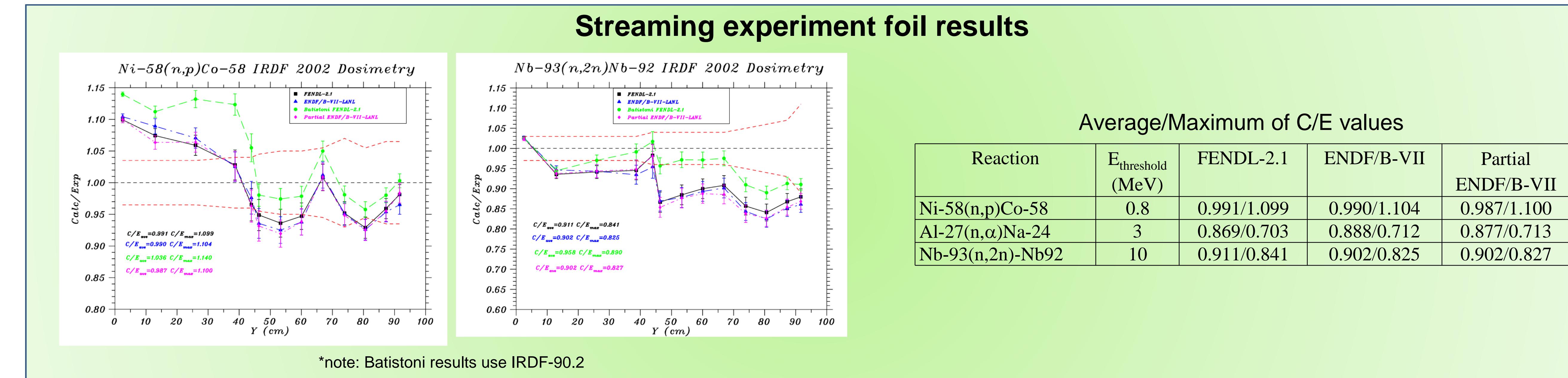
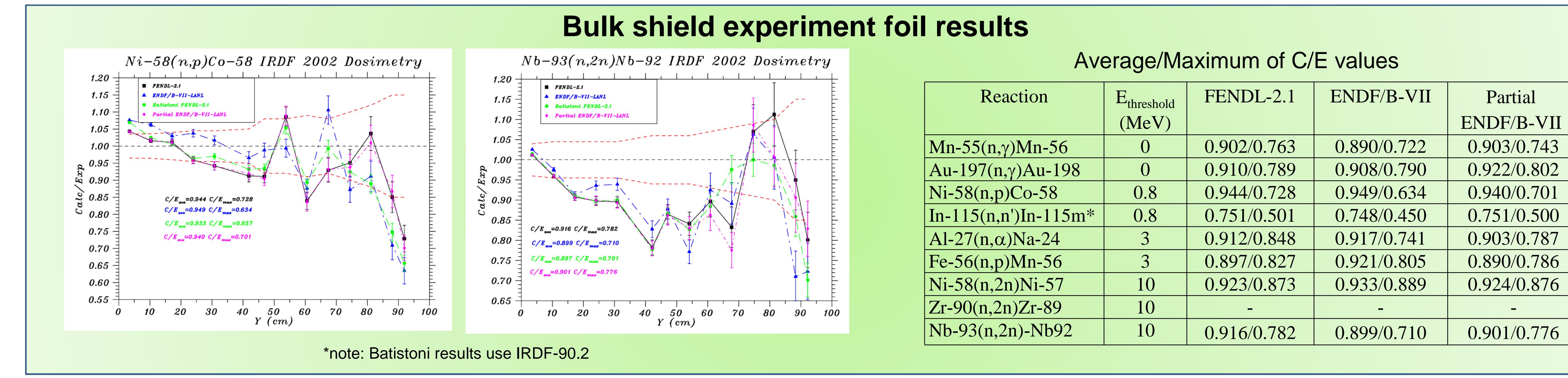
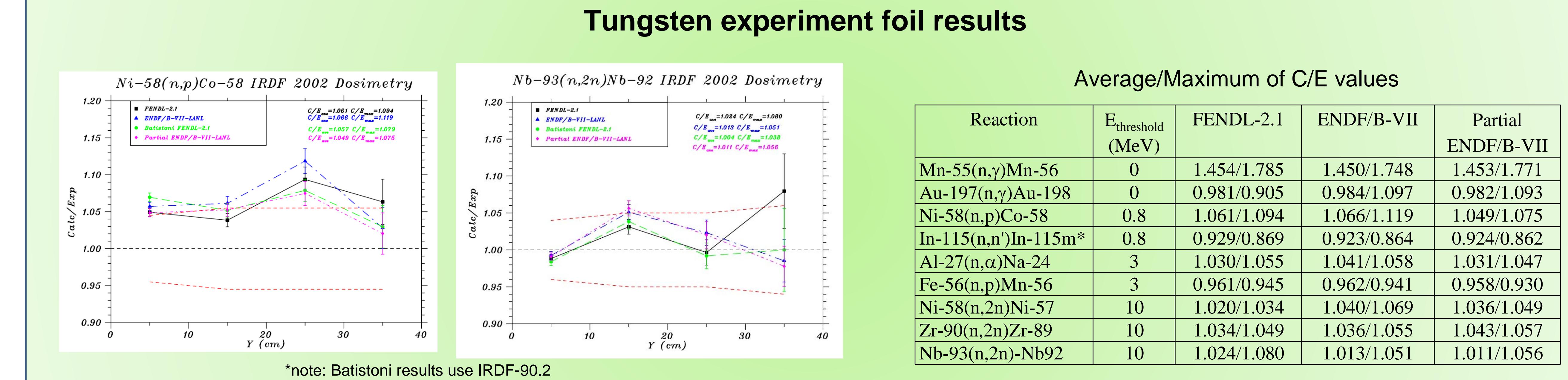
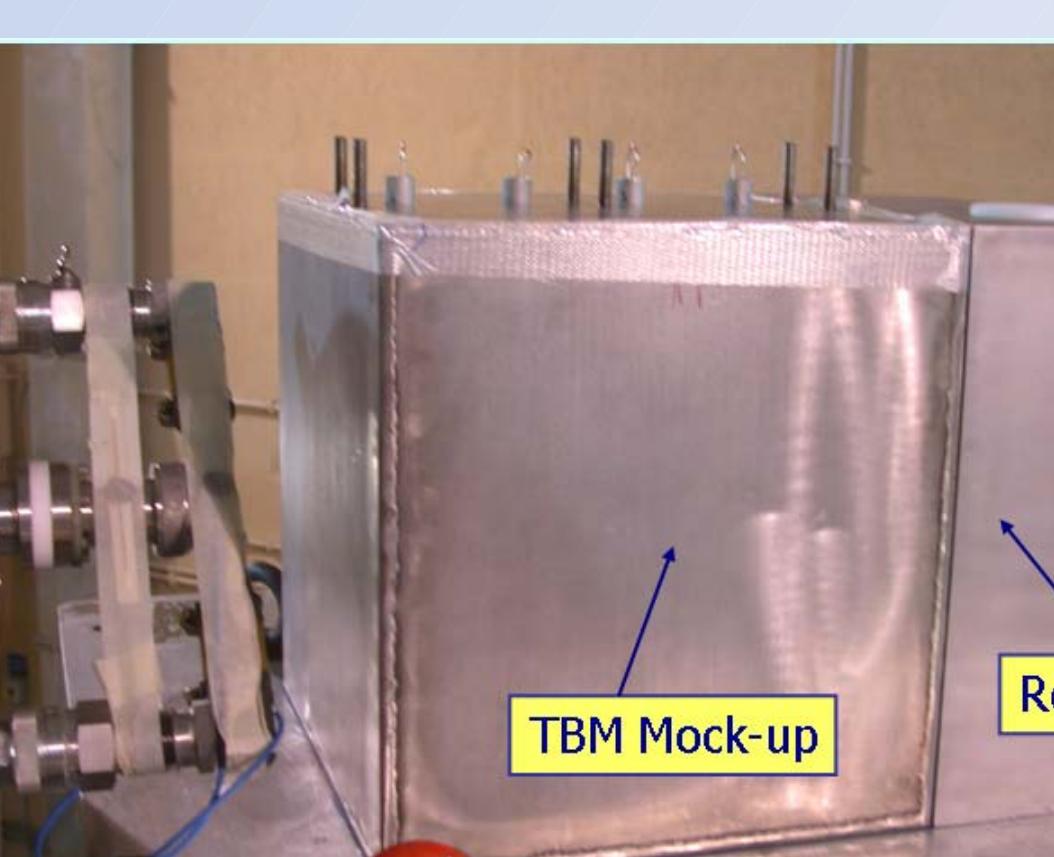
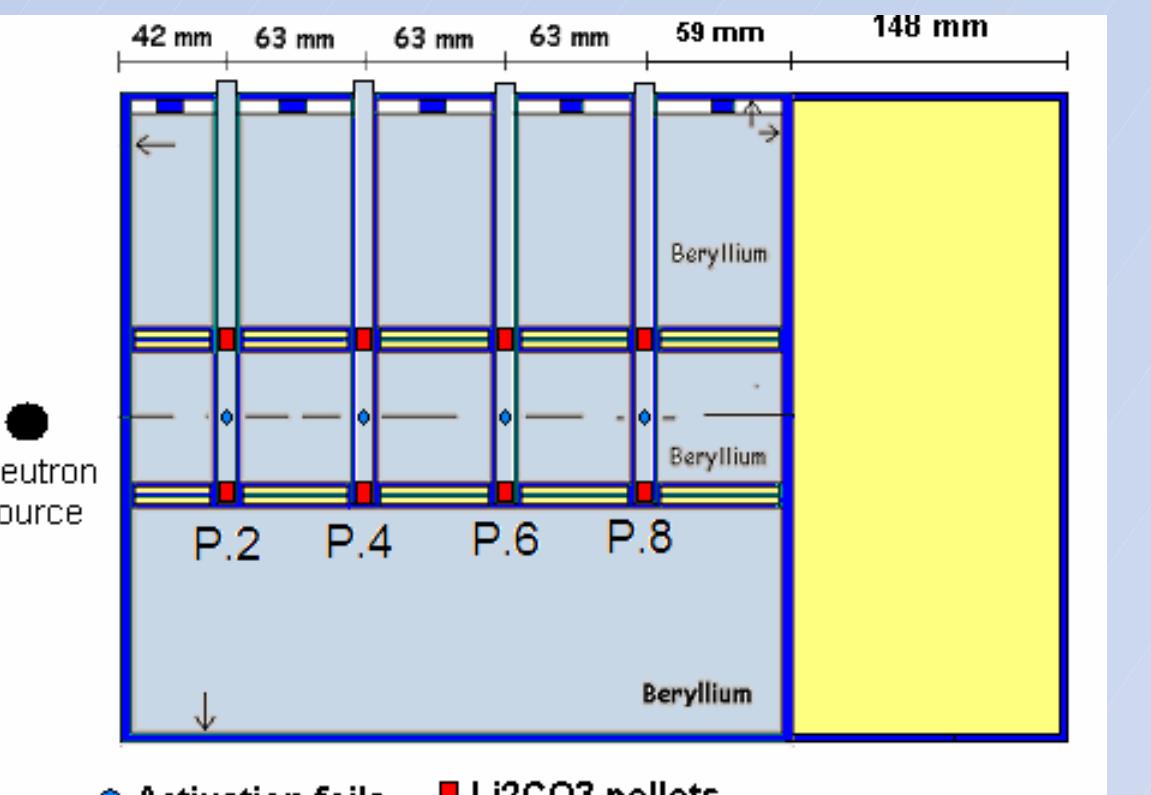
Tungsten experiment



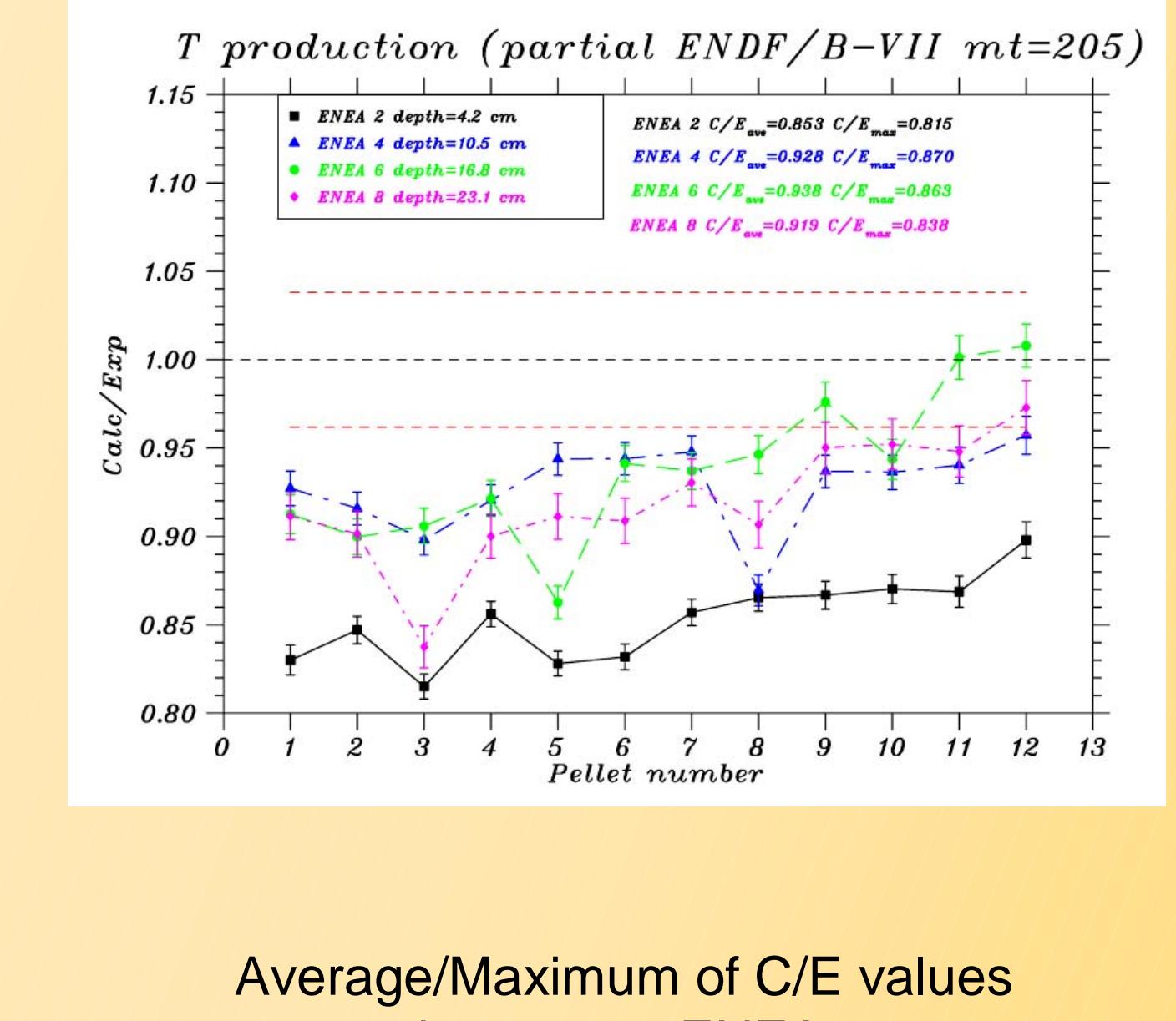
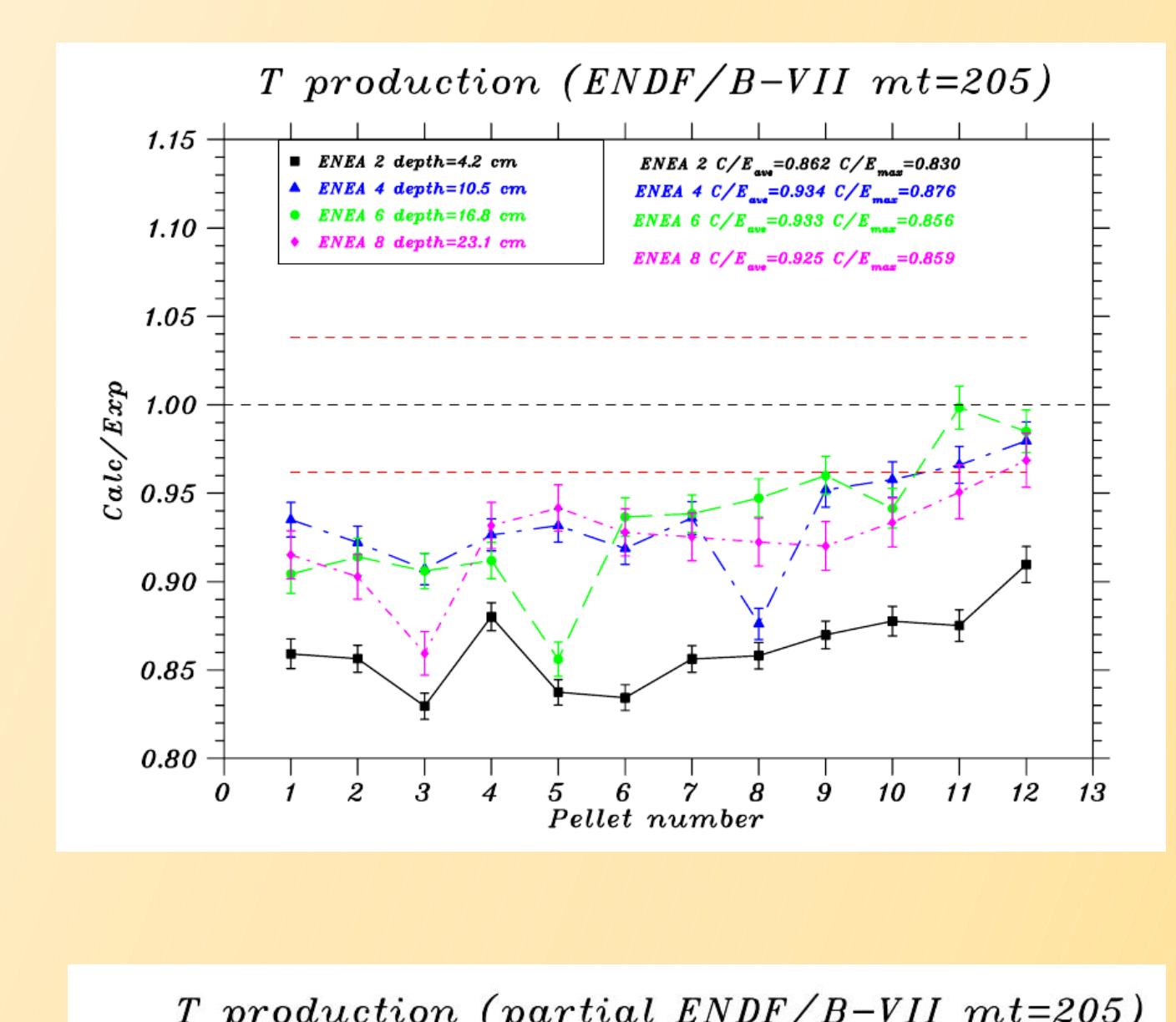
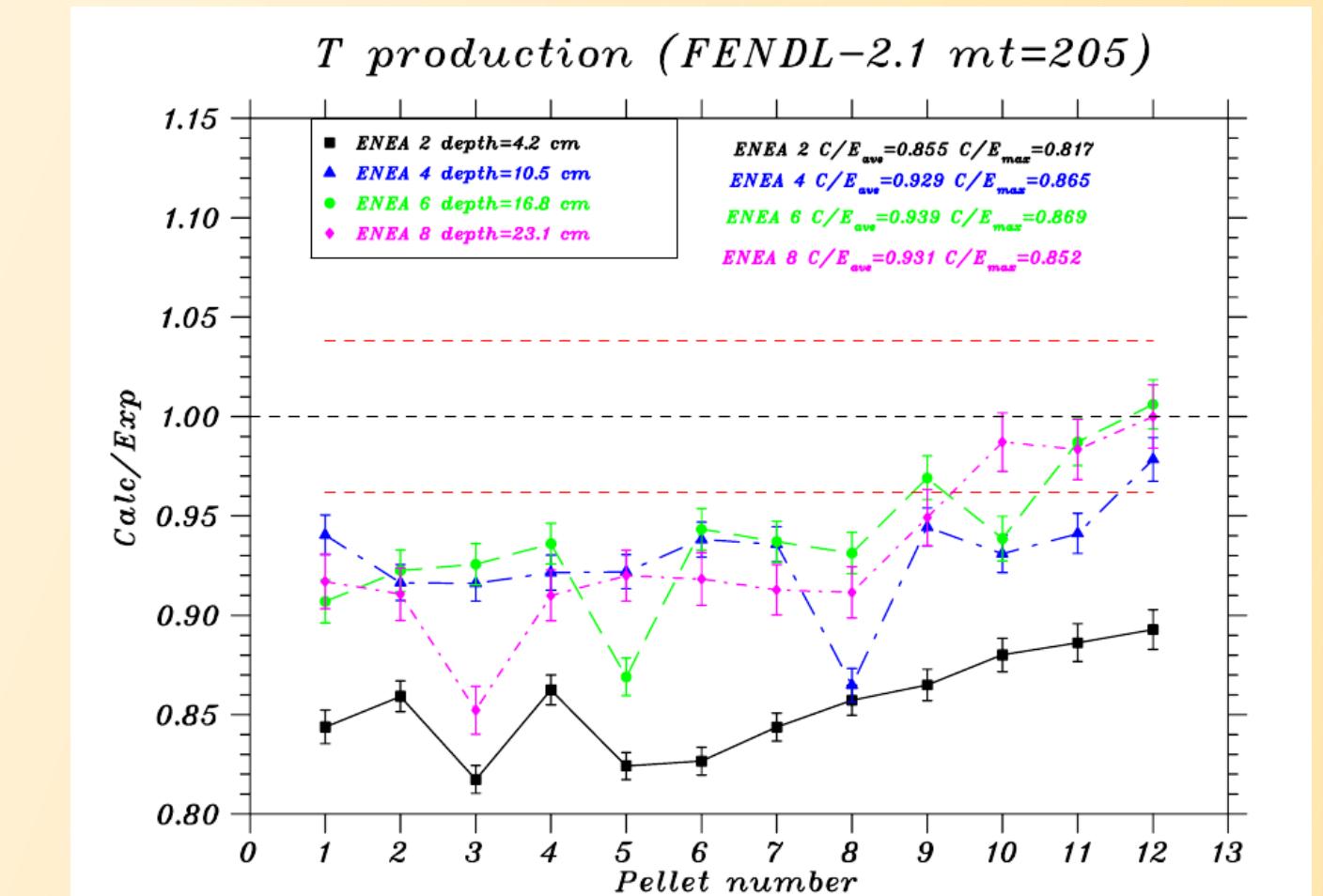
Bulk shield experiment



HCPB breeding experiment



HCPB experiment T production



Average/Maximum of C/E values at each 12 pellet ENEA group

Depth (mm)	FENDL-2.1	ENDF/B-VII	Partial ENDF/B-VII
42	0.855/0.817	0.862/0.830	0.853/0.815
105	0.929/0.865	0.934/0.876	0.928/0.870
168	0.939/0.869	0.933/0.856	0.938/0.863
231	0.931/0.852	0.925/0.859	0.919/0.838

Conclusions

- Calculations of foil activation rates using ENDF/B-VII.0 data were not significantly different than calculations using FENDL-2.1 data
- Calculations of tritium production using ENDF/B-VII.0 data were similar to calculations using FENDL-2.1 data
- Updating FENDL with ENDF/B-VII.0 data is not urgently needed for ITER