JEF/DOC-800

(E. Fort)

JEF2 validation

supplement to JEF/DOC-759

Performances in the fast range (UR--> 10 MeV)

REQUIREMENTS :

300 pcm	:	Keff,K^+
500 pcm	:	$B^2{}_m$
1.5 %	:	spectral indices , especially F9/F5, F8/F5, C8/F5
3%	:	β_{eff} (criticals)
		Na voiding

Global performances for all types of fuel (metallic, oxyde) given in the table

. Bias values and their standard deviations (indications on the dispersion in the predictions) to be considered together for a valid judgment

The JEF-2.2
Nuclear Data Library

JEF 2-2

JECCOLIB2 (JEF 2) ; AMERE

	before adjustment		after adjustment	
	Standard deviation	Bias	Standard deviation	Bias
Critical core (29) Keff (32)	1460 pcm 1635 1450 pcm	323 pcm 252 ± 560 262 ± 530	100 pcm 98 pcm 98 pcm	83 pcm 70 ± 170 32 ± 220
(45) B_m^2 (105)	1200 pcm 920 840 pcm	-210 pcm 40 ± 640 212 ± 640	150 pcm 130 130 pcm	-260 pcm -99 ± 500 -99 ± 500
(17) K^+ (19)	2200 pcm 2150 2050 pcm	-50 pcm 144 ± 130 144 ± 1300	240 pcm 33 33pcm	123 pcm 210 ± 740 -92 ± 530
(34) F49/F25 (35)	2.6% 3.2% 2.6%	1.1% 1% ± 1.8 1% ± 1.8	0.5% 0.45% 0.45%	0.3% -0.2% ± 1.8 -0.25% ± 1.9
(45) F28/F25 (45)	3.7% 3.5% 3.5%	-1% -0.8% ± 2 -0.8% ± 0.7	0.8% 0.8% 0.8%	-1% -1.% ± 2.4 -1.5% ± 2.5
(32) C28/F25 (35)	2.2% 1.6% 1.6%	1.4% 1% ± 2.2 1% ± 2.2	0.5% 0.5% 0.5%	1.2% 1.% ± 1.8 1.2% ± 1.9
(7) F40/F25 (7)	8.6% 8.6% .6%	-4% -4% -4%	1.6% 1.6% 1.6%	-1% -1% -0.8%
(16) F41/F25 (16)	5% 5% 5%	-1.4% -1.2% -1.2%	1.2% 1.2% 1.2%	0.5% 0.13% 0.5%
(7) F42/F25 (7)	8% 8% 8%	-5.2% -3.4% -3.4%	1.3% 1.2% 1.2%	-1.6% -1.5% -1%
(9) B10/F25 (9)	2.3% 2.3% .3%	-2% -2% -2%	0.8% 0.8% 0.8%	-1.3% -1% -1%

The JEF-2.2
Nuclear Data Library

JEF 2-2

MAJOR ACTINIDES

Nucleus	major observations	Work to be done	Work in progress ?	Availability for JEFF3 starter file
^{239}Pu	unresolved range $\sigma_{n,f}$ ↗2% E>1.5Mev n,2n x- section	partial reevaluation	Cadarache	June 1999
^{240}Pu	$\nu_{p\uparrow}$, $\sigma_{n,\gamma\downarrow}$, $\sigma_{n,f\downarrow}$ (E < 2 Mev)	Complete reevaluation	Cadarache. RR + U.R Bucarest . Bologne : continuum	End 1999
^{241}Pu	unresolved range, $(\sigma_{n,\gamma})\downarrow$, fission in 1stplateau (5%)	partial reevaluation	planned in Cadarache	End 1999 ?
^{242}Pu	Insufficient integral information $(\sigma_{n,\gamma})\downarrow$ 20%	Complete reevaluation	Bucarest .? Bologne : continuum	
^{238}U	ν_p ↗1.2 % (E<6 MeV), 0.7% (E>6 MeV), subthreshold fission ? $(\sigma_{n,n'})$ ↗5 % (E<2 MeV),	Local corrections		
^{235}U	RR + UR $(\sigma_{n,\gamma})\downarrow$ 10%		OAK-RIDGE ENDF B project ?	?

The JEF-2.2
Nuclear Data Library

JEF 2-2

Coolants, Absorbers, scatterers

Nucleus	major observations	Work to be done	Work in progres ?	Avaibality for JEFF3
^{23}Na	$(\sigma_{n,n'})$ ↘ 30 % (E<2 MeV), $(\sigma_{n,n})$ ↗ 30 % (E<2 MeV)	Complete reevaluation	GEEL +CAD Proposal for JEFF3	Model Analysis by GEEL (TRIESTE) E≤2Mev + JEF2 renormalised E>2Mev 1999
^{16}O	$(\sigma_{n,\gamma})$ ↗ 10 % E > 1 Mev) $\sigma_{n,\alpha})$ ↗ 20 % E > 3 Mev	Partial Correction	ASK ENDFproject and G. Hale (LANL)	
^{12}C				
^{10}B	$\sigma_{n,\alpha})$ ↗ 2 or 3 % [redacted] is it significant ?	Keep attention on work performed elsewhere (ENDF project)		

The JEF-2.2
Nuclear Data Library

JEF 2-2

Structurals Materials

Nucleus	major observations	Work to be done	Work in progress ?	Availability for JEFF3
^{56}Fe	Additional Integral information required Total ? $(\sigma_{n,n'})$ ↘20 % (E<2 MeV), $(\sigma_{n,\gamma})$ 1st resonance ^{54}Fe?	Probably complete reevaluation Solve ≠ OAK-RIDGE GEEL σ_t	Experimental in GEEL Evaluation : Bologne (TRKOV)	1999 ?
^{58}Ni	Integral information sufficient ? $(\sigma_{n,\gamma})$↓ 10%	Complete reevaluation	?	
^{52}Cr	Integral information sufficient ? $(\sigma_{n,n'})$ ↘20 % (25 KeV<E<1.3 MeV),	Complete reevaluation ?	R.R réevaluated in CAD	

Data Bank

The JEF-2.2
Nuclear Data Library

JEF 2-2

CONCLUSION

The JEF2.2 doesn't allow fast reactor calculations with the required accuracy

Nevertheless the data are of sufficient quality for a statistical adjustment procedure to be an efficient tool for improvement ,provided the present data of Na-23 are replaced by the proposed JEFF3 starter file data .