

# Notes on the GEFY library of fission-fragment yields

(GEFY 1.1, August 2011)

## Parameters:

The calculations for the GEFY library have been performed with the version 2011/3.6 of the GEF code, using the same parameter set for all fissioning systems. Only one parameter, a shell-energy correction of the outer barrier at the symmetric fission channel, has been adjusted for each specific fissioning system when data were available.

## Uncertainties:

The uncertainties of the fission yields given in the GEFY library represent the statistical uncertainties of the Monte-Carlo calculations performed with the GEF code. The true uncertainties of the yield predictions may be appreciably larger, in particular in the tails of the nuclide distributions.

## Prompt-neutron multiplicities:

The prompt-neutron multiplicities are calculated with the GEF code. Since they are not listed in the GEFY library due to the rules of the ENDF fission-yield format, the values for spontaneous fission of a few nuclei are listed in the following table. (All calculations have been performed with the same parameter set.)

$Z$	$A$	$\nu_{GEF}^-$	$\nu_{systematics}^-$ (a)	$\nu_{exp}^-$ (b)
90	228	1.34		
90	229	1.44		
90	230	1.39	1.39	
90	231	1.47		
90	232	1.49	1.50	
90	233	1.53		
90	234	1.54		
91	229	1.60		
91	230	1.61		
91	231	1.62	1.71	
91	232	1.65	1.71	
91	233	1.66		
91	234	1.69	1.80	
91	235	1.70	1.87	
92	230	1.87		
92	231	1.88		
92	232	1.88		
92	233	1.82		
92	234	1.86	1.80	
92	235	1.88	1.87	
92	236	1.93	1.90	
92	237	1.97		
92	238	2.03	2.00	
92	239	2.04		

92	240	2.10		
93	232	2.00		
93	233	2.00		
93	234	2.03		
93	235	2.08		
93	236	2.09		
93	237	2.13		
93	238	2.13		
93	239	2.19		
93	240	2.21		
93	241	2.26		
93	242	2.29		
94	234	2.28		
94	235	2.27		
94	236	2.30	2.12	
94	237	2.31		
94	238	2.37	2.21	
94	239	2.40	2.32	
94	240	2.50	2.151	
94	241	2.58		
94	242	2.63	2.141	
94	243	2.66		
94	244	2.63	2.29	
95	236	2.45		
95	237	2.48		
95	238	2.51		
95	239	2.55		
95	240	2.58		
95	241	2.65	2.50	
95	242	2.71	2.56	
95	243	2.80	2.61	
95	244	2.88		
95	245	2.98		
95	246	3.05		
96	240	2.79		
96	241	2.82		
96	242	2.88	2.528	$2.532 \pm 0.012$
96	243	2.91		
96	244	2.98	2.6875	$2.69 \pm 0.01$
96	245	3.05		
96	246	3.13	2.948	
96	247	3.21		
96	248	3.28	3.161	
96	249	3.37		
96	250	3.47	3.300	
97	242	3.00		
97	243	3.05		

97	244	3.09		
97	245	3.17		
97	246	3.21		
97	247	3.28		
97	248	3.34		
97	249	3.42	3.40	
97	250	3.49		
97	251	3.57		
97	252	3.66		
98	244	3.28		
98	245	3.31		
98	246	3.39		
98	247	3.42		
98	248	3.50		
98	249	3.55	3.4	
98	250	3.61	3.52	
98	251	3.69		
98	252	3.77	3.756	$3.7590 \pm 0.0048$
98	253	3.84		
98	254	3.91		
99	244	3.40		
99	245	3.46		
99	246	3.51		
99	247	3.57		
99	248	3.62		
99	249	3.69		
99	250	3.73		
99	251	3.81		
99	252	3.88		
99	253	3.97	4.70	
99	254	4.06		
99	255	4.12		
99	256	4.15		
99	257	4.19		
99	258	2.30		
100	244	3.60		
100	245	3.62		
100	246	3.68		
100	247	3.73		
100	248	3.80		
100	249	3.84		
100	250	3.92		
100	251	3.96		
100	252	4.03		
100	253	4.11		
100	254	4.21		
100	255	4.29		
100	256	4.38		
100	257	4.43		

100	258	2.53	(Note: The reduction of the prompt-neutron yield for $A > 257$ is due to the strong weight of the narrow symmetric fission channel, characterised by high TKE values. See also $^{258}\text{Es}$ .)
100	259	2.55	
100	260	2.66	

- a) Values from JEFF report 20, M. A. Kellet et al., OECD/NEA, 2009
- b) Values from PhD thesis of R. W. Mills, Univ. of Birmingham, 1995