^{166}Er(γ,γ') 1996Ma18,1976Me04,1973Me17

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 109, 1103 (2008)	1-Mar-2008

Other studies: 1991Zi01.

1973Me17: bremsstrahlung E=1.6-4.2 MeV; measured $\sigma(98°)$ and $\sigma(127°)$ (1976Me04).

1996Ma18: bremsstrahlung endpoint energy=3.55 MeV; 95.5% ^{166}Er metal target; HPGE detector, 3 Ge detectors, true-coaxial HPGE Compton polarimeter with 8-crystal BGO Compton shield; θ=95°, 127°; measured Eγ, integrated cross section, γ anisotropy, γ polarization; deduced Γ_0, $\Gamma^2_{\gamma0}/\Gamma$, $\Gamma_{\gamma1}/\Gamma_{\gamma0}$, J^π, K.

^{166}Er Levels

Values of K, deduced by 1996Ma18 from measured $\Gamma_{\gamma1}/\Gamma_{\gamma0}$, are given In comments on the relevant levels.

E(level)[†]	J^π[@]	$T_{1/2}$[‡]	$\Gamma^2_{\gamma0}/\Gamma$ (meV)[#]	Comments
0	0^+			
80.6	2^+			E(level): rounded value from Adopted Levels. J^π: from Adopted Levels.
1663 *1*	1^-	5.2 fs *5*	13.9 *16*	E(level): from 1991Zi01. K=(0) (1996Ma18). $\Gamma^2_{\gamma0}/\Gamma$: weighted average of 15.2 *17* (1996Ma18) and 17.1 *11* (1991Zi01, from reported $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=1.50 *4* and $\Gamma_{\gamma0}$=42.8 meV *28*) and 12.0 *8* (1976Me04).
1812 *1*	$1^{(+)}$	34 fs *7*	5.5 *10*	E(level): from 1973Me17. $T_{1/2}$: value becomes 39 fs *7* based on adopted branching. $\Gamma^2_{\gamma0}/\Gamma$: weighted average of 7.0 *9* (1996Ma18) and 4.8 *6* (1976Me04). K=1 (1996Ma18).
1830		45 fs *8*		E(level): from 1973Me17; not reported In 1996Ma18. $T_{1/2}$: $\Gamma_{\gamma0}\Gamma_{\gamma1}/\Gamma$=1.8 *3* meV (1973Me17); deduced by evaluator from authors' calculated $\Gamma_{\gamma0}$ and assumed $\Gamma_{\gamma1}/\Gamma$. Assuming adopted I(1749γ):I(1830γ)=100.0 *21*:29.9 *5* and J=1, this gives Γ=10.1 *17* meV.
2055?				from 1976Me04. $\Gamma^2_{\gamma0}/\Gamma$=0.8 *5* meV if the only branch is to the g.s.
2202	$1^{(+)}$	9.7 fs *12*	5.8 *6*	$\Gamma^2_{\gamma0}/\Gamma$: weighted average of 6.1 *9* (1996Ma16) and 5.4 *9* (1976Me04). K=0 (1996Ma18).
2465	1	43 fs *6*	5.1 *5*	K=1 (1996Ma18). $T_{1/2}$: from $\Gamma^2_{\gamma0}/\Gamma$=5.1 *5* and adopted $\Gamma_{\gamma0}/\Gamma_{\gamma1}$=0.44 *7*. $\Gamma^2_{\gamma0}/\Gamma$: weighted average of 5.3 *3* (1996Ma16) and 3.9 *8* (1976Me04).
2525	1	23 fs *3*	8.7 *10*	$\Gamma^2_{\gamma0}/\Gamma$: weighted average of 9.0 *13* (1996Ma16) and 8.3 *17* (1976Me04). K=1 (1996Ma18).
2601	1	12 fs *3*	16 *3*	$\Gamma^2_{\gamma0}/\Gamma$: weighted average of 23 *4* (1996Ma16) and 15.4 *16* (1976Me04). K=1 (1996Ma18).
2679	1	20 fs *3*	9.8 *9*	$\Gamma^2_{\gamma0}/\Gamma$: weighted average of 10.0 *10* (1996Ma16) and 9.1 *19* (1976Me04). K=1 (1996Ma18).
2768	1	22 fs *4*	5.2 *5*	$\Gamma^2_{\gamma0}/\Gamma$: weighted average of 5.1 *5* (1996Ma16) and 5.8 *11* (1976Me04). K=0 (1996Ma18).
2783	1	49 fs *14*	2.6 *5*	$\Gamma^2_{\gamma0}/\Gamma$: weighted average of 3.2 *6* (1996Ma16) and 2.2 *5* (1976Me04). $T_{1/2}$: from $\Gamma^2_{\gamma0}/\Gamma$=2.6 *5* and adopted $\Gamma_{\gamma0}/\Gamma$=0.53 *6*.
2812	1	3.1 fs *3*	18.9 *13*	K=0 (1996Ma18). $\Gamma^2_{\gamma0}/\Gamma$: weighted average of 19.1 *16* (1996Ma16) and 18.6 *23* (1976Me04).
3073	1	11 fs *4*	2.4 *4*	K=0 (1996Ma18).
3123	1	17 fs *6*	6.3 *6*	K=(0) (1996Ma18).
3144	1	5.4 fs *5*	39 *3*	E(level): 3141 In 1973Me17. $\Gamma^2_{\gamma0}/\Gamma$: weighted average of 42 *3* (1996Ma16) and 35 *4* (1976Me04). K=1 (1996Ma18).

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^{166}Er(γ,γ') 1996Ma18,1976Me04,1973Me17 (continued)

^{166}Er Levels (continued)

E(level)†	Jπ@	$T_{1/2}$‡	$\Gamma^2_{\gamma0}/\Gamma$ (meV)#	Comments
3175	1	11.8 fs *15*	14.9 *16*	K=(1) (1996Ma18).
3187	1	11.4 fs *10*	18.0 *13*	K=1 (1996Ma18).
3197	1	7.4 fs *7*	27.0 *25*	$\Gamma^2_{\gamma0}/\Gamma$: weighted average of 29.0 *21* (1996Ma16) and 23.8 *27* (1976Me04). K=1 (1996Ma18). E(level): 3193 In 1973Me17.
3288	1	6.0 fs *9*	11.9 *13*	K=(0) (1996Ma18).
3322	1	5.8 fs *14*	7.5 *11*	K=0 (1996Ma18).
3329	1	15.0 fs *25*	15.5 *21*	K=1 (1996Ma18).
3386	1	5.3 fs *12*	14.3 *25*	K=(0) (1996Ma18).
3425	1	38 fs *19*	12 *6*	
3430	1	13 fs *3*	22 *5*	K=1 (1996Ma18).
3440	1	3.4 fs *13*	9.3 *27*	K=0 (1996Ma18).
3493	1		20 *18*	
3498	1		10 *10*	

† From 1996Ma18, except As noted.
‡ Deduced from measured $\Gamma^2_{\gamma0}/\Gamma$ and $\Gamma_{\gamma1}/\Gamma_{\gamma0}$, assuming $\Gamma=\Gamma_{\gamma1}+\Gamma_{\gamma0}$, except As noted. thus, deduced $T_{1/2}$ will Be an upper limit if branches exist to levels other than the g.s. and the 81-keV level.
# From 1996Ma18, except As noted. calculated by evaluator from integrated cross section data of 1996Ma18 assuming J indicated, unless noted otherwise.
@ From γ multipolarity (based on γ anisotropy) In 1996Ma18 and γ polarization (1973Me17). J=1,2 are the only possible spin choices for the levels excited by bremsstrahlung in a ^{168}Er target.

$\gamma(^{166}Er)$

E_i(level)	J^π_i	E_γ†	I_γ‡	E_f	J^π_f	Mult.#	Comments
1663	1^-	1582	152 *4*	80.6	2^+	E1	I_γ: from weighted average of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=1.50 *6* (1996Ma18), 1.50 *4* (1991Zi01) and 1.63 *7* (1973Me17). Mult.: from 1973Me17.
		1663	100	0	0^+	E1	Mult.: from 1973Me17.
1812	$1^{(+)}$	1732	56 *9*	80.6	2^+		I_γ: from weighted average of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.48 *5* (1996Ma18) and 0.67 *6* (1973Me17).
		1813	100	0	0^+	(M1)	Mult.: D, $\Delta\pi$=(No) from 1973Me17.
1830		1749	100	80.6	2^+		
		1830		0	0^+		I_γ: weak branch; consistent with $\Gamma_{\gamma1}/\Gamma_{\gamma0}\approx3$ expected by authors from earlier decay studies (1973Me17).
2202	$1^{(+)}$	2121	186 *9*	80.6	2^+		I_γ: from weighted average of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=1.88 *10* (1996Ma18) and 1.78 *23* (1976Me04).
		2202	100	0	0^+	D	Mult.: $\Delta\pi$=(No) (1976Me04).
2465	1	2384	38 *6*	80.6	2^+		I_γ: from weighted average of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.36 *6* (1996Ma18) and 0.59 *20* (1976Me04).
		2465	100	0	0^+	D	
2525	1	2444	51 *5*	80.6	2^+		I_γ: from weighted average of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.52 *5* (1996Ma18) and 0.41 *20* (1976Me04).
		2525	100	0	0^+	D	
2601	1	2520	53 *9*	80.6	2^+		I_γ: from weighted average of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.52 *10* (1996Ma18) and 0.61 *26* (1976Me04).
		2601	100	0	0^+	D	
2679	1	2598	53 *11*	80.6	2^+		I_γ: from weighted average of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.52 *11* (1996Ma18) and 0.7 *4* (1976Me04).
		2679	100	0	0^+	D	

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^{166}Er(γ,γ') 1996Ma18,1976Me04,1973Me17 (continued)

$\gamma(^{166}Er)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
2768	1	2687	150 *18*	80.6	2^+		I_γ: from weighted average of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=1.57 *20* (1996Ma18) and 1.2 *4* (1976Me04).
		2768	100	0	0^+	D	
2783	1	2702	53 *6*	80.6	2^+		I_γ: from Adopted Gammas; $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.43 *41* In 1976Me04.
		2783	100	0	0^+	D	Mult.: from 1996Ma18.
2812	1	2731	181 *9*	80.6	2^+		I_γ: from weighted average of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=1.80 *9* (1996Ma18) and 2.1 *4* (1976Me04).
		2812	100	0	0^+	D	
3073	1	2992	320 *60*	80.6	2^+		I_γ: from $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=3.2 *6* (1996Ma18).
		3073	100	0	0^+	D	
3123	1	3042	105 *35*	80.6	2^+		I_γ: from $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=1.05 *35* (1996Ma18).
		3123	100	0	0^+	D	
3144	1	3063	47 *3*	80.6	2^+		I_γ: from weighted average of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.48 *3* (1996Ma18) and 0.39 *10* (1976Me04).
		3144	100	0	0^+	D	
3175	1	3094	61 *6*	80.6	2^+		I_γ: from $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.61 *6* (1996Ma18).
		3175	100	0	0^+	D	
3187	1	3106	49 *4*	80.6	2^+		I_γ: from $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.49 *4* (1996Ma18).
		3187	100	0	0^+	D	
3197	1	3116	51 *3*	80.6	2^+		I_γ: from weighted average of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.52 *3* (1996Ma18) and 0.41 *10* (1976Me04).
		3197	100	0	0^+	D	
3288	1	3207	152 *13*	80.6	2^+		I_γ: from $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=1.52 *13* (1996Ma18).
		3288	100	0	0^+	D	
3322	1	3241	223 *31*	80.6	2^+		I_γ: from $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=2.23 *31* (1996Ma18).
		3322	100	0	0^+	D	
3329	1	3248	40 *7*	80.6	2^+		I_γ: from $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.40 *7* (1996Ma18).
		3329	100	0	0^+	D	
3386	1	3305	146 *16*	80.6	2^+		I_γ: from $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=1.46 *16* (1996Ma18).
		3386	100	0	0^+	D	
3425	1	3425	100	0	0^+	D	
3430	1	3349	24 *6*	80.6	2^+		I_γ: from $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=0.24 *6* (1996Ma18).
		3430	100	0	0^+	D	
3440	1	3359	280 *50*	80.6	2^+		I_γ: from $\Gamma_{\gamma1}/\Gamma_{\gamma0}$=2.8 *5* (1996Ma18).
		3440	100	0	0^+	D	
3493	1	3493	100	0	0^+	D	
3498	1	3498	100	0	0^+	D	

[†] From level energy difference, except As noted.

[‡] Relative branching based on $(\Gamma_{\gamma1}/\Gamma_{\gamma0})$ calculated by evaluator from experimental $R=(\Gamma_{\gamma1}/\Gamma_{\gamma0})(E_{\gamma0}/E_{\gamma1})^3$ In 1996Ma18, except As noted. values of $\Gamma_{\gamma1}/\Gamma_{\gamma0}$ are given In comments.

[#] ΔJ from γ anisotropy (1996Ma18), $\Delta\pi$ from γ linear polarization (1976Me04, except As noted).

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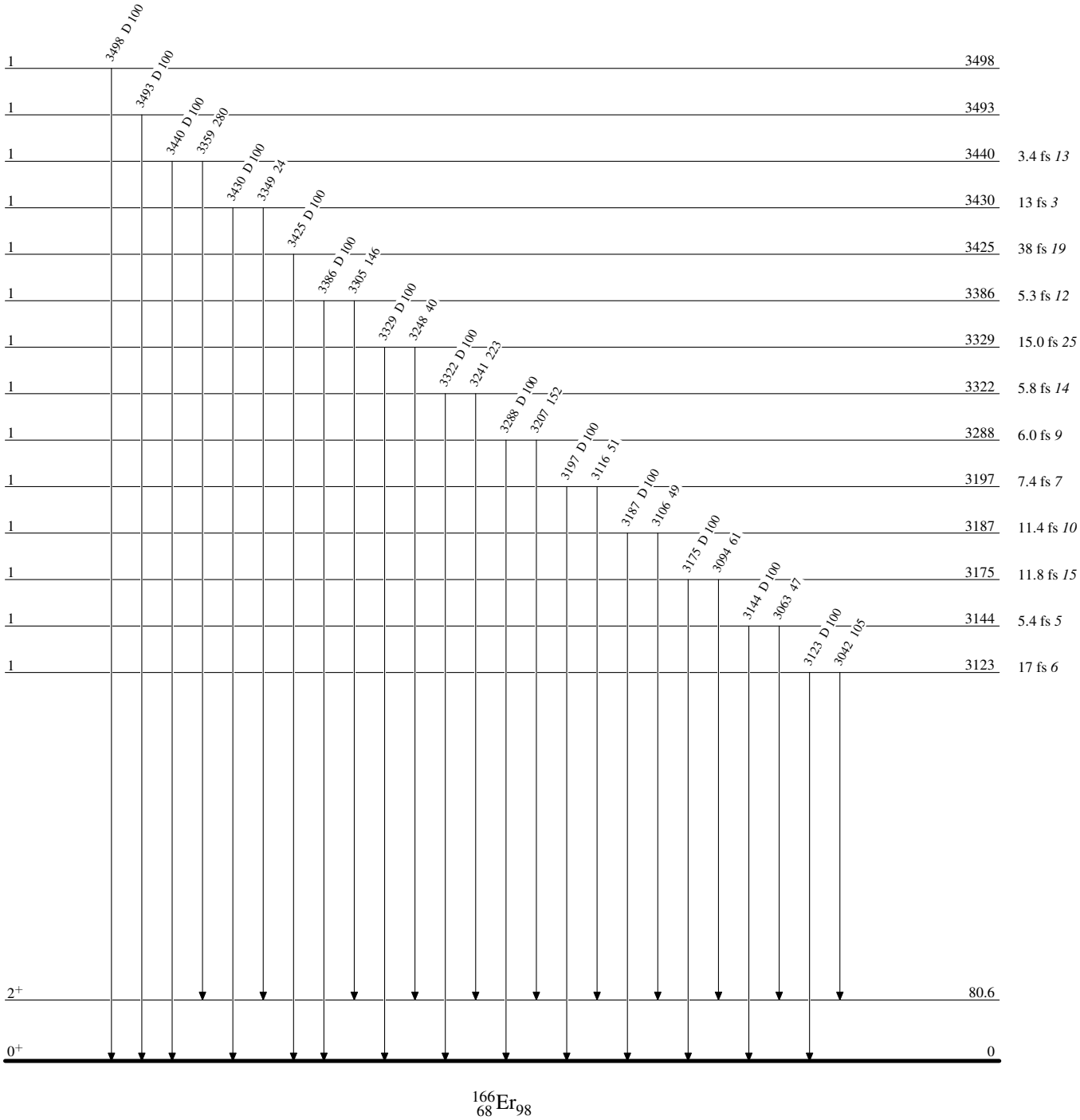
Level Scheme

Intensities: Relative photon branching from each level

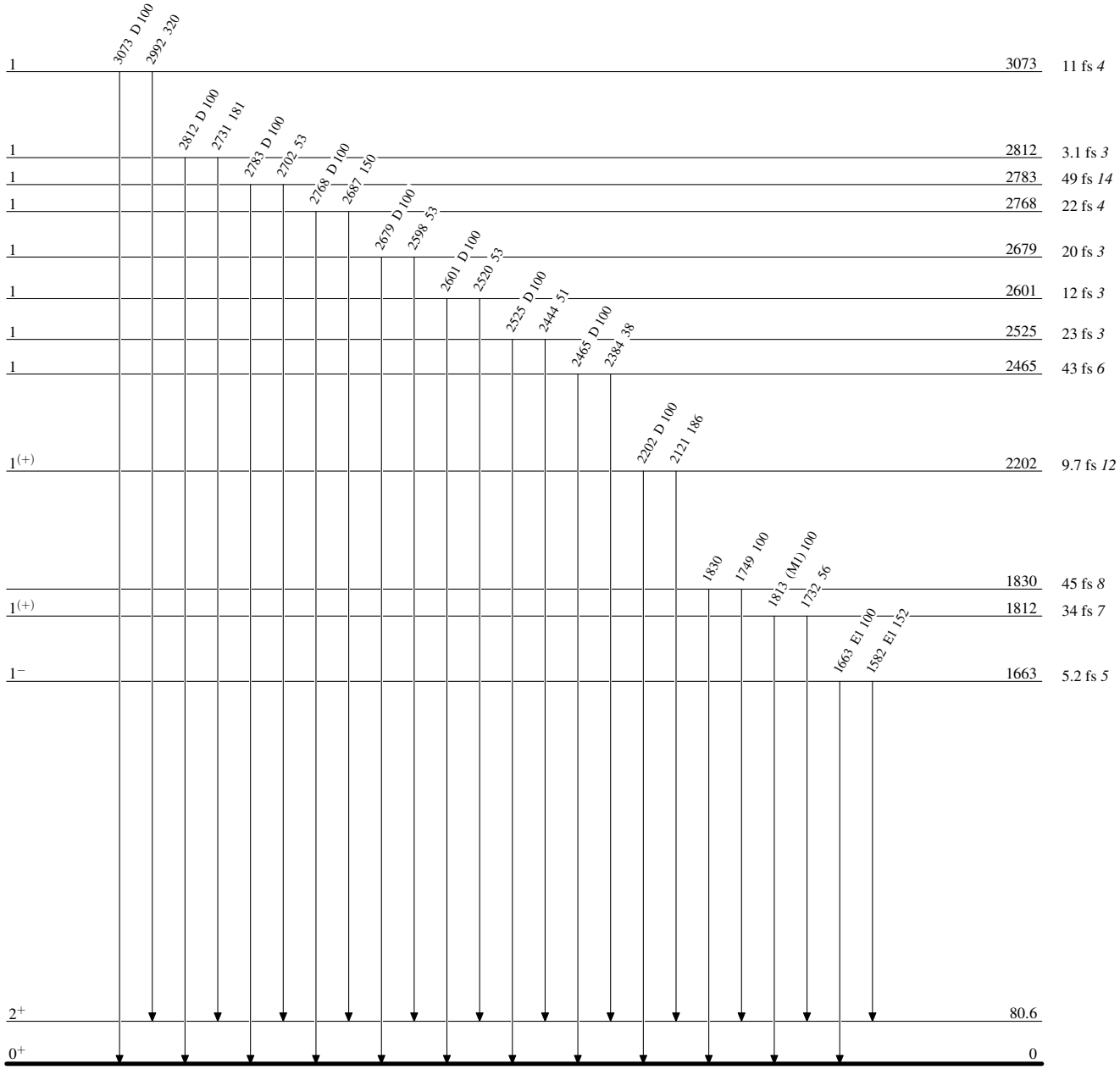


$^{166}_{68}Er_{98}$

^{166}Er(γ,γ') 1996Ma18,1976Me04,1973Me17

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{166}_{68}Er_{98}$