^{154}Sm(α,3nγ) 1970Lo04,1999HuZY,2011Sh08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 160, 1 (2019)	21-Oct-2019

Additional information 1.

2011Sh08, 2010Sh16: compiled for XUNDL by G. Gürdal (ANL).

2000Hu04: compiled for XUNDL by J. Chenkin and B. Singh (McMaster).

1970Lo04: E(α) varied in order to locate optimum for the (α,3n) reaction. The Iγ values given are those measured at E(α)=34 MeV. Enriched (99.5% ^{154}Sm) self-supporting metallic targets. γ rays were detected using a 20 cm^3 Ge(Li) detector and spectra were measured at angles of 90°, 125°, 140° and 155°. Eγ, Iγ and angular-distribution coefficients were measured.

1999HuZY: excitation function measured between E(α)=28 and 36 MeV. Data reported for E(α)=33 MeV, the optimum value for this study. Self-supporting target, thickness=1.5 mg/cm^2, enrichment not given. γ radiation studied using 5 anti-Compton high-purity BGO-shielded Ge detectors placed at angles of 30, 37, 90, 143, and 270° with respect to the beam axis. Measured γγ and DCO ratios. Report Eγ for γ′s in the g.s. and mixed positive-parity band and for three new bands.

2002Le15: many of the same authors as 1999HuZY. Self-supporting target (98.65% ^{154}Sm), 1.4 mg/cm^2 thick bombarded by 33-MeV α′s. A "clover"-type HPGE detector in conjunction a segmented Compton polarimeter (25 segments) was used. Report linear polarizations for a number of γ′s in the 11/2$^-$[505] and the mixed positive-parity bands.

Other studies from this same group are 2000Hu04 and 2000HuZY. These contain essentially the same data as 1999HuZY, but are less complete.

2011Sh08, 2010Sh16: ^{154}Sm(α,3nγ), $E_α$=35 MeV, 4 mg/cm^2 ^{154}Sm target. Collected ≈5*10^8 γγ coincidences using iThemba LABS Compton-suppressed γ-ray spectrometer array, AFRODITE, consisting of 8 Clover and 8 four-fold segmented LEPS detectors. Measured Eγ, γγ, γγ(θ)(DCO), γ-ray polarizations (with no evidence).

^{155}Gd Levels

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]
0.0[#]	3/2⁻	896.7[@] *13*	17/2⁻	1889.8?[b] *16*	27/2⁻	2460.2[b] *17*	31/2⁻
60.0[@] *6*	5/2⁻	931.5[h] *15*	J2	1912.7[e] *17*	21/2⁻	2496.4 *18*	
86.6[a] *7*	5/2⁺	1107.3[f] *15*	J0+2	1920.7 *18*		2578.4 *17*	
105.3[&] *7*	3/2⁺	1113.4[c] *15*	21/2⁻	1933.9 *17*		2694.3[d] *19*	27/2⁻
107.6[a] *10*	9/2⁺	1142.5[#] *16*	19/2⁻	1966.9 *18*		2702.4[#] *24*	31/2⁻
118.0[&] *9*	7/2⁺	1144.6[a] *15*	25/2⁺	1995.0[f] *16*	J0+6	2752.8[h] *19*	J2+8
121.5[b] *13*	11/2⁻	1220.2[&] *15*	23/2⁺	2016.7 *18*		2757.3[c] *17*	33/2⁻
146.1[#] *8*	7/2⁻	1255.8[g] *15*	J1+2	2120.4 *18*		2758.5[g] *17*	J1+8
214.3[a] *12*	13/2⁺	1282.3[d] *15*	15/2⁻	2134.4 *18*		2824.3 *14*	
230.1[&] *11*	11/2⁺	1303.3[h] *15*	J2+2	2136.2[#] *21*	27/2⁻	2825.5[a] *18*	37/2⁺
251.6[@] *9*	9/2⁻	1326.1[@] *17*	21/2⁻	2137.8 *17*		2883.3[@] *24*	33/2⁻
283.2[c] *15*	13/2⁻	1359.8[b] *15*	23/2⁻	2145.0 *20*		2977.4[e] *19*	29/2⁻
392.5[#] *10*	11/2⁻	1460.3[e] *15*	17/2⁻	2160.9[d] *18*	23/2⁻	3015.6[&] *20*	35/2⁺
423.9[a] *14*	17/2⁺	1522.6[f] *15*	J0+4	2170.4[c] *16*	29/2⁻	3064.1[b] *18*	35/2⁻
453.7[&] *13*	15/2⁺	1615.5[#] *19*	23/2⁻	2188.7[g] *16*	J1+6	3082.5 *17*	
464.4[b] *15*	15/2⁻	1619.4[c] *15*	25/2⁻	2199.4[a] *17*	33/2⁺	3273.4[d] *20*	31/2⁻
533.9[@] *11*	13/2⁻	1635.7[a] *16*	29/2⁺	2226.4[h] *16*	J2+6	3377.7[c] *19*	37/2⁻
663.9[c] *15*	17/2⁻	1679.0[d] *17*	19/2⁻	2241.4 *18*		3506.0[a] *20*	41/2⁺
729.9[#] *12*	15/2⁻	1686.9[g] *15*	J1+4	2331.5[@] *22*	29/2⁻	3577.4[e] *22*	33/2⁻
736.9[a] *14*	21/2⁺	1709.9 *18*		2343.9 *18*		3702.1[b] *21*	39/2⁻
754.8[f] *15*	J0	1740.9[h] *15*	J2+4	2345.5[&] *17*	31/2⁺	4035.7[c] *21*	41/2⁻
786.8[&] *15*	19/2⁺	1743.3[&] *16*	27/2⁺	2351.4 *18*		4378.1[b] *23*	43/2⁻
880.7[b] *15*	19/2⁻	1806.9 *18*		2421.6[e] *18*	25/2⁻	4729.7[c] *24*	45/2⁻
889.2[g] *15*	J1	1809.0[@] *19*	25/2⁻	2429.4 *18*			

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^{154}Sm(α,3nγ) 1970Lo04,1999HuZY,2011Sh08 (continued)

^{155}Gd Levels (continued)

† Computed from a least-squares using the listed γ-ray energies (assuming Δ(Eγ)=1 keV, when not stated).
‡ From adopted values.
# Band(A): 3/2$^-$[521] g.s. band, signature=−1/2 branch.
@ Band(a): 3/2$^-$[521] g.s. band, signature=+1/2 branch.
& Band(B): Mixed positive-parity band, signature=−1/2 branch.
[a] Band(b): Mixed positive-parity band, signature=+1/2 branch.
[b] Band(C): ν11/2$^-$[505], signature=−1/2 branch.
[c] Band(c): ν11/2$^-$[505], signature=+1/2 branch.
[d] Band(d): K^π=15/2$^-$, ν11/2[505]⊗2$^+$ (γ-vib), signature=−1/2 branch. Probable structure of this band is the 2$^+$ phonon coupled to 11/2$^-$[505] orbital, K=2+11/2=15/2, this is the K=2+j coupling rather than the K=2−j one (2011Sh08).
[e] Band(D): K^π=15/2$^-$, ν11/2[505]⊗2$^+$ (γ-vib), signature=+1/2 branch.
[f] Band(E): Proposed band. 2000Hu04 and 2000HuZY suggest that π=− for this band.
[g] Band(F): Proposed band. 2000Hu04 and 2000HuZY suggest that π=− for this band.
[h] Band(G): Proposed band. 2000Hu04 and 2000HuZY suggest that π=− for this band.

γ(^{155}Gd)

E$_\gamma$ †	I$_\gamma$ ‡	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.#	δ@	Comments
10.5&		118.0	7/2$^+$	107.6	9/2$^+$			
13.9&		121.5	11/2$^-$	107.6	9/2$^+$			
18.7&		105.3	3/2$^+$	86.6	5/2$^+$			
21.0&		107.6	9/2$^+$	86.6	5/2$^+$			
26.5&		86.6	5/2$^+$	60.0	5/2$^-$			
31.4&		118.0	7/2$^+$	86.6	5/2$^+$			
45.3&		105.3	3/2$^+$	60.0	5/2$^-$			
58.0&		118.0	7/2$^+$	60.0	5/2$^-$			
59.8		60.0	5/2$^-$	0.0	3/2$^-$			
86.0		146.1	7/2$^-$	60.0	5/2$^-$			E$_\gamma$: nominal value from Adopted Values. 1999HuZY report Eγ=86.6 on their level scheme, but this may be a misprint. Value may be affected by the presence of the very strong 86.6 γ.
86.6	100.0	86.6	5/2$^+$	0.0	3/2$^-$			
105.3&		105.3	3/2$^+$	0.0	3/2$^-$			
105.6	3.2	251.6	9/2$^-$	146.1	7/2$^-$	M1+E2		
106.7	32.2	214.3	13/2$^+$	107.6	9/2$^+$	E2		
112.2	2.5	230.1	11/2$^+$	118.0	7/2$^+$	E2		
122.6	≤10.0	230.1	11/2$^+$	107.6	9/2$^+$	(M1+E2)		I$_\gamma$: peak contains a contribution from a ^{154}Gd line.
140.8[g]	5.2[g]	392.5	11/2$^-$	251.6	9/2$^-$	M1+E2		E$_\gamma$: reported as 141.0 by 1970Lo04 and shown as doubly placed.
141.5[g]	5.2[g]	533.9	13/2$^-$	392.5	11/2$^-$			E$_\gamma$: reported as 141.0 by 1970Lo04 and shown as doubly placed.
146.3	1.6	146.1	7/2$^-$	0.0	3/2$^-$			
161.3	20.2	283.2	13/2$^-$	121.5	11/2$^-$	M1+E2[d]	−0.73 +33−11	
167.3		896.7	17/2$^-$	729.9	15/2$^-$			
x176.1[b]	1.6							
178[a]		1460.3	17/2$^-$	1282.3	15/2$^-$	M1[f]		
181.1	17.9	464.4	15/2$^-$	283.2	13/2$^-$	M1+E2[d]	−0.49 +17−35	δ: other: 0.26 4, deduced from relative

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^{154}Sm(α,3nγ) 1970Lo04,1999HuZY,2011Sh08 (continued)

γ(^{155}Gd) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	δ[@]	Comments
								intensities of the deexciting cascade and crossover γ rays.
191.6	4.0	251.6	9/2$^-$	60.0	5/2$^-$	E2		
^{x}196.3[b]	3.0							
196.7		729.9	15/2$^-$	533.9	13/2$^-$			
199.3	16.7	663.9	17/2$^-$	464.4	15/2$^-$	(M1+E2)[d]		I_γ: peak contains a contribution from a ^{156}Gd line. This contribution is not included in the listed Iγ value.
204[a]		2137.8		1933.9				
209.6	56.2	423.9	17/2$^+$	214.3	13/2$^+$	E2[e]		
216.7	8.6	880.7	19/2$^-$	663.9	17/2$^-$	M1+E2	−0.29 *11*	δ: other: 0.26 *4*, deduced from relative intensities of the deexciting cascade and crossover γ rays.
^{x}218.8	2.2							Placed, together with a questionably and multiply placed 362.7 γ, by 1970Lo04 from a 752.0 level assigned as the 15/2$^-$ member of the g.s. band. The 15/2$^-$ member of the g.s. band is now located at 729 keV, removing the evidence for a 752.0 level. Accordingly, the evaluator has removed this level from the scheme and has shown the 218.8 γ as unplaced and the 362.7 γ as singly placed.
219[a]		1679.0	19/2$^-$	1460.3	17/2$^-$	M1[f]		
223.6	18.5	453.7	15/2$^+$	230.1	11/2$^+$	E2[e]		
232.4	7.1	1113.4	21/2$^-$	880.7	19/2$^-$	M1+E2[d]	−0.33 *+8−16*	δ: other: 0.24 *4*, deduced from relative intensities of the deexciting cascade and crossover γ rays.
233[a]		2578.4		2345.5	31/2$^+$			
234[a]		1912.7	21/2$^-$	1679.0	19/2$^-$	M1[f]		
239.4	8.0	453.7	15/2$^+$	214.3	13/2$^+$	M1+E2[d]	−1.2 *8*	
245[a]		2824.3		2578.4				
245.9[h]	3.0[h]	1359.8	23/2$^-$	1113.4	21/2$^-$			
246.2[h]	5.6[h]	392.5	11/2$^-$	146.1	7/2$^-$			E_γ: reported as 245.9 by 1970Lo04.
248[a]		2160.9	23/2$^-$	1912.7	21/2$^-$	M1[f]		
257[a]		3082.5		2825.5	37/2$^+$			
259.1	2.3	1619.4	25/2$^-$	1359.8	23/2$^-$	M1+E2[d]	−0.60 *+24−30*	
261[a]		2421.6	25/2$^-$	2160.9	23/2$^-$	M1[f]		
270.3	1.2	1889.8?	27/2$^-$	1619.4	25/2$^-$	M1+E2	−0.45 *+20−45*	
273[a]		2694.3	27/2$^-$	2421.6	25/2$^-$	M1[f]		
281[a]		2170.4	29/2$^-$	1889.8?	27/2$^-$			
282.4	7.2	533.9	13/2$^-$	251.6	9/2$^-$	E2		
283[a]		2977.4	29/2$^-$	2694.3	27/2$^-$	M1[f]		
^{x}289.9[b]	0.7							
290[a]		2460.2	31/2$^-$	2170.4	29/2$^-$			
296[a]		3273.4	31/2$^-$	2977.4	29/2$^-$	M1[f]		
297[a]		2757.3	33/2$^-$	2460.2	31/2$^-$			
306[a]		3064.1	35/2$^-$	2758.5	J1+8			
313.0	44.2	736.9	21/2$^+$	423.9	17/2$^+$	E2[e]		
313[a]		3377.7	37/2$^-$	3064.1	35/2$^-$			
333.2	19.5	786.8	19/2$^+$	453.7	15/2$^+$	E2[e]		

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^{154}Sm(α,3nγ) 1970Lo04,1999HuZY,2011Sh08 (continued)

γ(^{155}Gd) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	Comments
[x]337.2	5.6						
337.2		729.9	15/2⁻	392.5	11/2⁻		
342.9	3.8	464.4	15/2⁻	121.5	11/2⁻	E2	
347[a]		1460.3	17/2⁻	1113.4	21/2⁻		
352.5		1107.3	J0+2	754.8	J0	Q[c]	
362.4		896.7	17/2⁻	533.9	13/2⁻		
362.7[i]	12.7	786.8	19/2⁺	423.9	17/2⁺	(M1+E2)	
366.7		1255.8	J1+2	889.2	J1	Q[c]	
[x]371.7[b]	2.7						
371.7		1303.3	J2+2	931.5	J2	Q[c]	
[x]378.7[b]	2.4						
380.7	≤17.6	663.9	17/2⁻	283.2	13/2⁻	E2[e]	I_γ: peak contains a contribution from a ^{156}Gd line.
407.7	28.2	1144.6	25/2⁺	736.9	21/2⁺	E2[e]	
412.6		1142.5	19/2⁻	729.9	15/2⁻		
415.2		1522.6	J0+4	1107.3	J0+2	Q[c]	
416.6	6.3	880.7	19/2⁻	464.4	15/2⁻	E2	
429.4		1326.1	21/2⁻	896.7	17/2⁻		
[x]429.9	6.2						
431.2		1686.9	J1+4	1255.8	J1+2	Q[c]	
433.5	16.3	1220.2	23/2⁺	786.8	19/2⁺	E2[e]	
[x]437.5[b]	2.4						
437.6		1740.9	J2+4	1303.3	J2+2	Q[c]	
449.6	6.1	1113.4	21/2⁻	663.9	17/2⁻	E2	
452[a]		1912.7	21/2⁻	1460.3	17/2⁻		
[x]462.3[b]	1.5						
466[a]		2145.0		1679.0	19/2⁻		
472.3		1995.0	J0+6	1522.6	J0+4	Q[c]	
[x]473.0[b]	3.8						
473.0		1615.5	23/2⁻	1142.5	19/2⁻		
479.3[b]	2.6	1359.8	23/2⁻	880.7	19/2⁻		
482[a]		2160.9	23/2⁻	1679.0	19/2⁻		
482.9		1809.0	25/2⁻	1326.1	21/2⁻		
483.3[b]	5.4	1220.2	23/2⁺	736.9	21/2⁺	(M1+E2)	
485.6		2226.4	J2+6	1740.9	J2+4	Q[c]	
[x]486.5[b]	1.8						
491.1	15.5	1635.7	29/2⁺	1144.6	25/2⁺	E2[e]	
501.8		2188.7	J1+6	1686.9	J1+4	Q[c]	
[x]502.1[b]	1.3						
506.3[b]	6.7	1619.4	25/2⁻	1113.4	21/2⁻		
509[a]		2421.6	25/2⁻	1912.7	21/2⁻		
520.7		2136.2	27/2⁻	1615.5	23/2⁻		
522.5		2331.5	29/2⁻	1809.0	25/2⁻		
523.1		1743.3	27/2⁺	1220.2	23/2⁺		
[x]523.3[b]	9.4						
526.4		2752.8	J2+8	2226.4	J2+6	Q[c]	
530[a]		1889.8?	27/2⁻	1359.8	23/2⁻		
[x]530.3	3.2						
533[a]		2694.3	27/2⁻	2160.9	23/2⁻		
[x]533.4[b]	1.3						
[x]539.8	3.0						
540.5		754.8	J0	214.3	13/2⁺		Mult.: from a linear polarization measurement, 2003Le20

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$^{154}Sm(\alpha,3n\gamma)$ 1970Lo04,1999HuZY,2011Sh08 (continued)

$\gamma(^{155}Gd)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	Comments
							report that this γ is a magnetic, rather than an electric, multipole.
551[a]		2170.4	29/2⁻	1619.4	25/2⁻		
[x]551.6	4.5						
551.8		2883.3	33/2⁻	2331.5	29/2⁻		
556[a]		2977.4	29/2⁻	2421.6	25/2⁻		
563.7		2199.4	33/2⁺	1635.7	29/2⁺	E2[e]	
[x]564.0[b]	7.2						
566.2		2702.4	31/2⁻	2136.2	27/2⁻		
[x]569.7[b]	2.5						
569.8		2758.5	J1+8	2188.7	J1+6	Q[c]	
570[a]		2460.2	31/2⁻	1889.8?	27/2⁻		
579[a]		3273.4	31/2⁻	2694.3	27/2⁻		
580[a]		1460.3	17/2⁻	880.7	19/2⁻		
587[a]		2757.3	33/2⁻	2170.4	29/2⁻		
600[a]		3577.4	33/2⁻	2977.4	29/2⁻		
602.2		2345.5	31/2⁺	1743.3	27/2⁺		
604[a]		3064.1	35/2⁻	2460.2	31/2⁻		
621[a]		3377.7	37/2⁻	2757.3	33/2⁻		
626.2		2825.5	37/2⁺	2199.4	33/2⁺	E2[e]	δ: 2002Le15 place this γ from a 37/2⁻ level, but the evaluator believes that 37/2⁺ was meant.
638[a]		3702.1	39/2⁻	3064.1	35/2⁻		
658[a]		4035.7	41/2⁻	3377.7	37/2⁻		
670.1		3015.6	35/2⁺	2345.5	31/2⁺		
675.1		889.2	J1	214.3	13/2⁺		
676[a]		4378.1	43/2⁻	3702.1	39/2⁻		
680.5		3506.0	41/2⁺	2825.5	37/2⁺		
683.4		1107.3	J0+2	423.9	17/2⁺		
694[a]		4729.7	45/2⁻	4035.7	41/2⁻		
717.2		931.5	J2	214.3	13/2⁺		Mult.: from a linear polarization measurement, 2003Le20 report that this γ is a magnetic, rather than an electric, multipole.
785.8		1522.6	J0+4	736.9	21/2⁺		
796[a]		1460.3	17/2⁻	663.9	17/2⁻		
831.9		1255.8	J1+2	423.9	17/2⁺		
850.4		1995.0	J0+6	1144.6	25/2⁺		
877[a]		2496.4		1619.4	25/2⁻		
879.5		1303.3	J2+2	423.9	17/2⁺		
912[a]		3082.5		2170.4	29/2⁻		
935[a]		2824.3		1889.8?	27/2⁻		
950.0		1686.9	J1+4	736.9	21/2⁺		
959[a]		2578.4		1619.4	25/2⁻		
984[a]		2343.9		1359.8	23/2⁻		
996[a]		1460.3	17/2⁻	464.4	15/2⁻		
999[a]		1282.3	15/2⁻	283.2	13/2⁻		
1004.1		1740.9	J2+4	736.9	21/2⁺		
1007[a]		2120.4		1113.4	21/2⁻		
1021[a]		2134.4		1113.4	21/2⁻		
1040[a]		1920.7		880.7	19/2⁻		
1044.1		2188.7	J1+6	1144.6	25/2⁺		
1046[a]		1709.9		663.9	17/2⁻		
1081.6		2226.4	J2+6	1144.6	25/2⁺		
1122.8		2758.5	J1+8	1635.7	29/2⁺		
1128[a]		2241.4		1113.4	21/2⁻		

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^{154}Sm(α,3nγ) 1970Lo04,1999HuZY,2011Sh08 (continued)

γ(^{155}Gd) (continued)

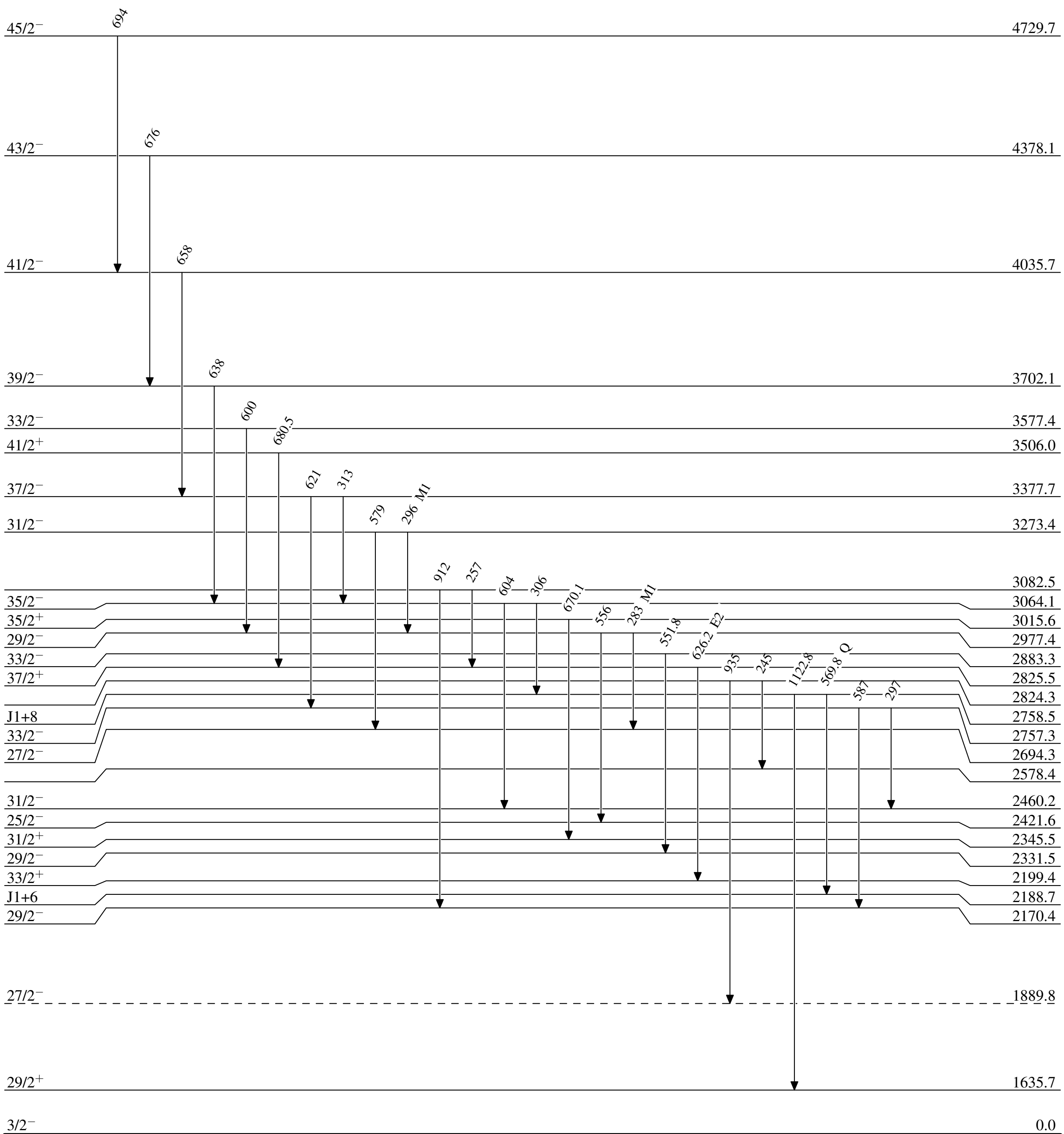
E_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	E_γ[†]	E_i(level)	J^π_i	E_f	J^π_f
1136[a]	2016.7		880.7	19/2⁻		1257[a]	2137.8		880.7	19/2⁻
1143[a]	1806.9		663.9	17/2⁻		1270[a]	1933.9		663.9	17/2⁻
1161[a]	1282.3	15/2⁻	121.5	11/2⁻	E2[f]	1303[a]	1966.9		663.9	17/2⁻
1238[a]	2351.4		1113.4	21/2⁻		1316[a]	2429.4		1113.4	21/2⁻

[†] From 1999HuZY, unless otherwise noted.
[‡] Values from 1970Lo04. Uncertainties in these values range from 10% to 30%.
[#] Unless noted otherwise, deduced from the measured angular distributions of 1970Lo04 and the DCO ratios of 1999HuZY (although these authors do not explicitly list these data). Strictly speaking, these data do not distinguish between E1 and M1 and between E2 and M2. However, the listed mults are supported by rotational-band considerations and, in several instances, by the linear-polarization data of 2002Le15.
[@] Unless otherwise noted, deduced from the measured angular distributions (1970Lo04). Of the two possible values obtainable from this analysis, only the one giving the smaller E2 admixture is shown by 1970Lo04.
[&] Nominal value from the adopted values. γ not reported in these studies, but from other studies is known to be present.
[a] From 2011Sh08.
[b] Assignment to ^{155}Gd is tentative.
[c] Mult=Q, from DCO ratio data of 2000HuZY (and earlier studies by this group).
[d] From their linear-polarization data, 2002Le15 report mult=M1 (the evaluator believes that these data do not rule out a small E2 admixture).
[e] 2002Le15 report mult=E2.
[f] From 2010Sh16 and 2011Sh08 by $\gamma\gamma(\theta)$(DCO) and γ-ray polarization measurements (the evaluator believes that the mult=M1 values do not rule out a small E2 admixture).
[g] Multiply placed with undivided intensity.
[h] Multiply placed with intensity suitably divided.
[i] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

$^{154}Sm(\alpha,3n\gamma)$ 1970Lo04,1999HuZY,2011Sh08

Level Scheme

Intensities: Relative I_γ

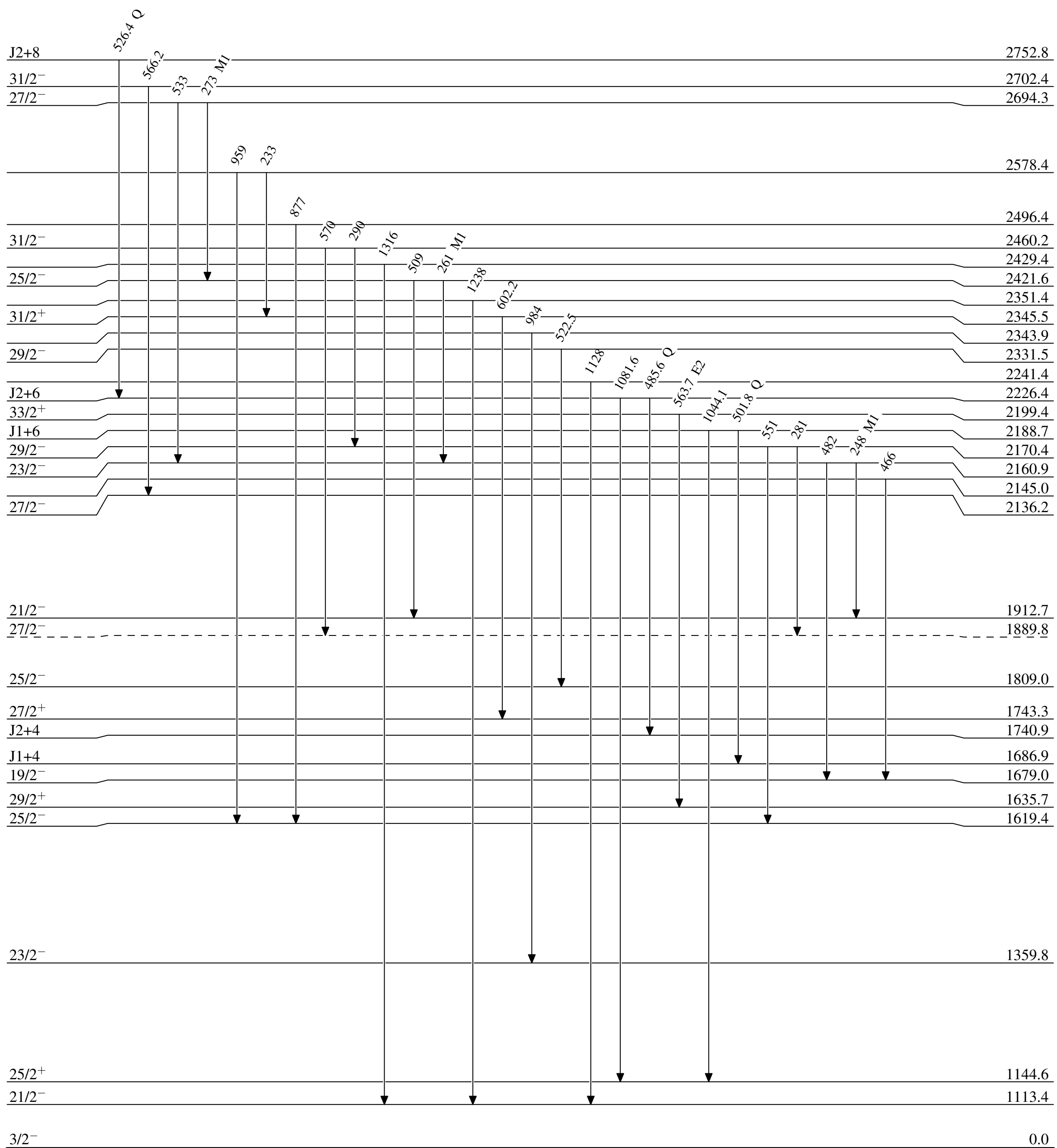


$^{155}_{64}Gd_{91}$

^{154}Sm(α,3nγ) 1970Lo04,1999HuZY,2011Sh08

Level Scheme (continued)

Intensities: Relative I_γ

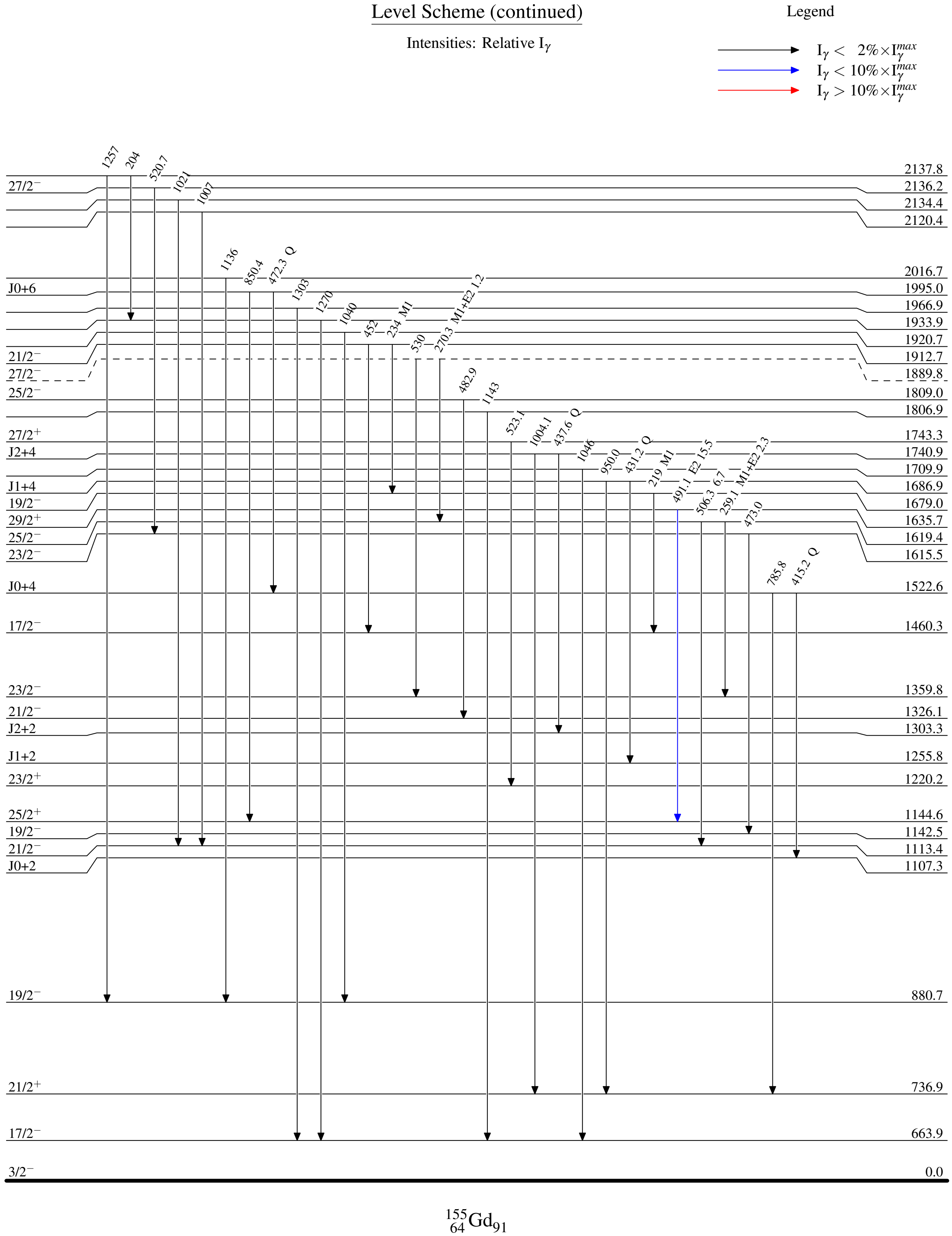


$^{155}_{64}Gd_{91}$

^{154}Sm(α,3nγ) 1970Lo04,1999HuZY,2011Sh08

Level Scheme (continued)

Intensities: Relative I_γ

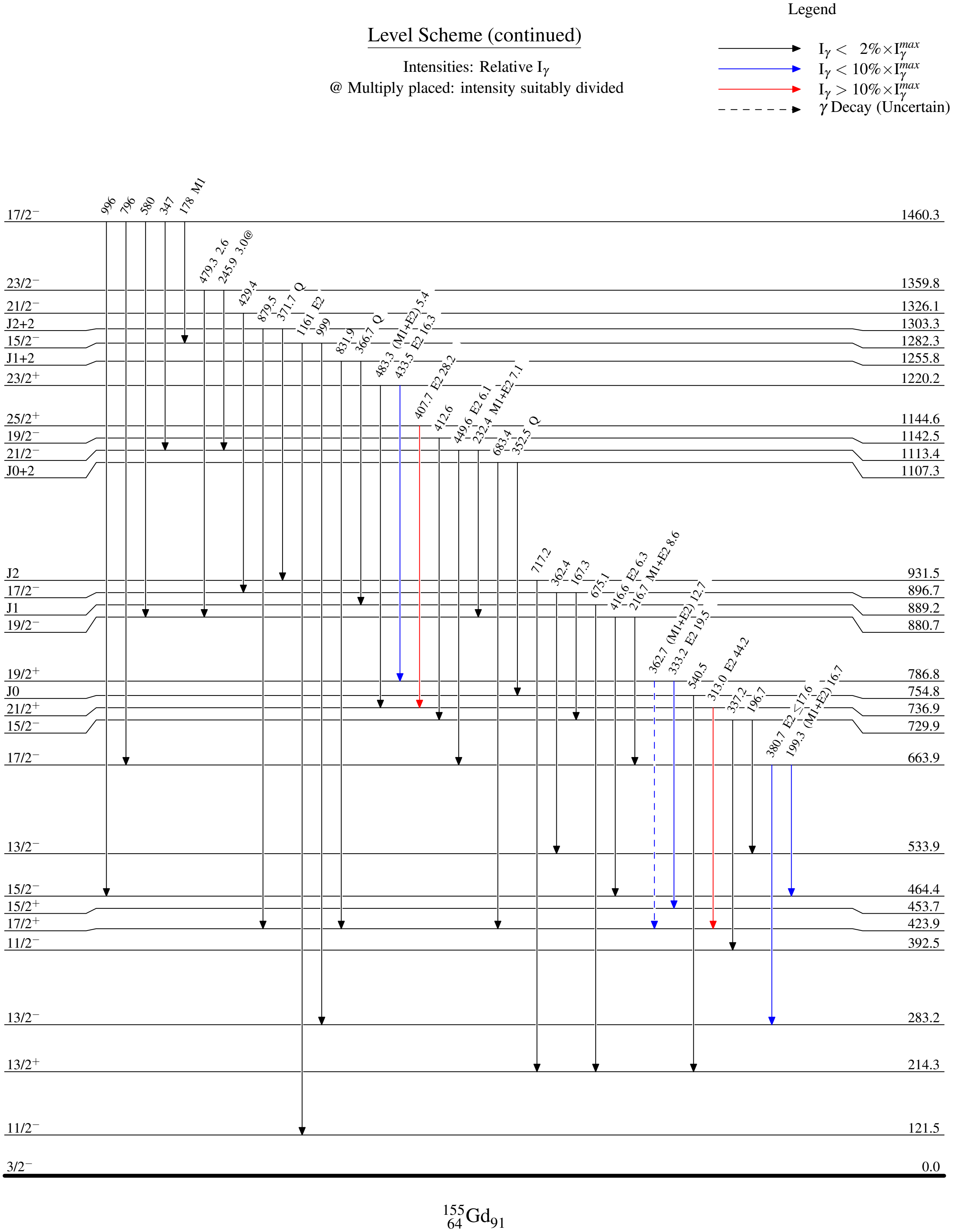


$^{154}Sm(\alpha,3n\gamma)$ 1970Lo04,1999HuZY,2011Sh08

Level Scheme (continued)

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided



$^{154}Sm(\alpha,3n\gamma)$ 1970Lo04,1999HuZY,2011Sh08

Level Scheme (continued)

Intensities: Relative I_γ

& Multiply placed: undivided intensity given

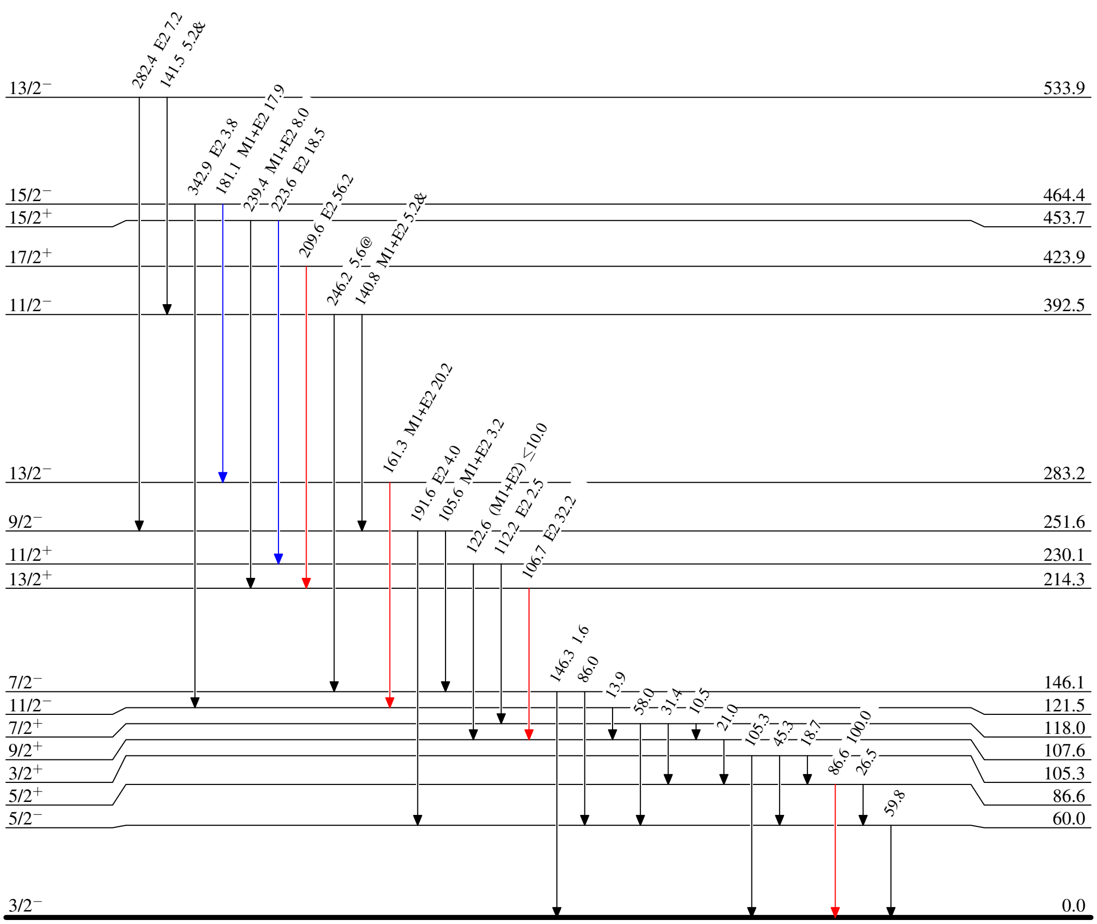
@ Multiply placed: intensity suitably divided

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

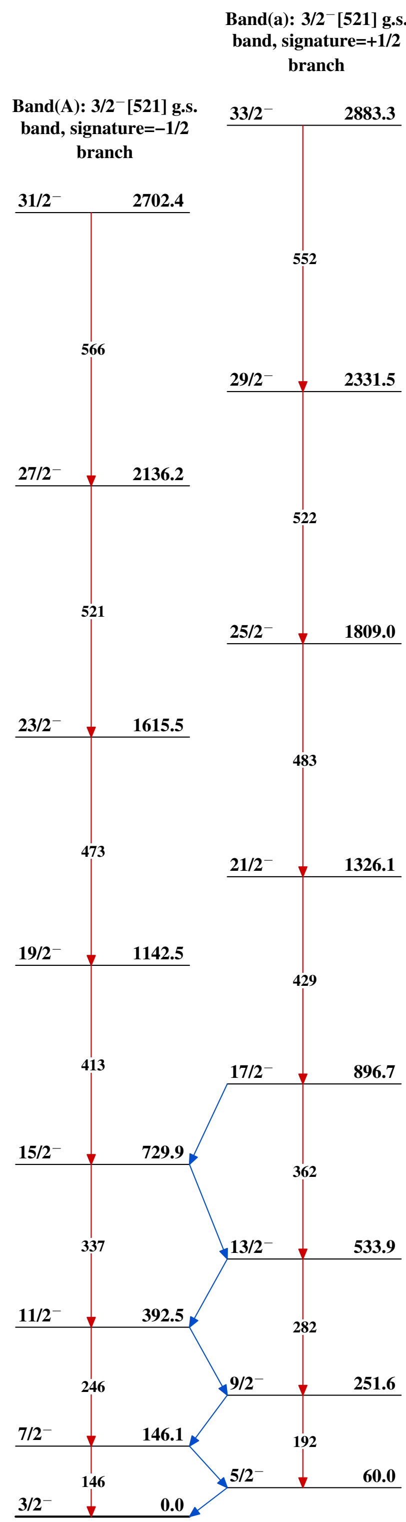
$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



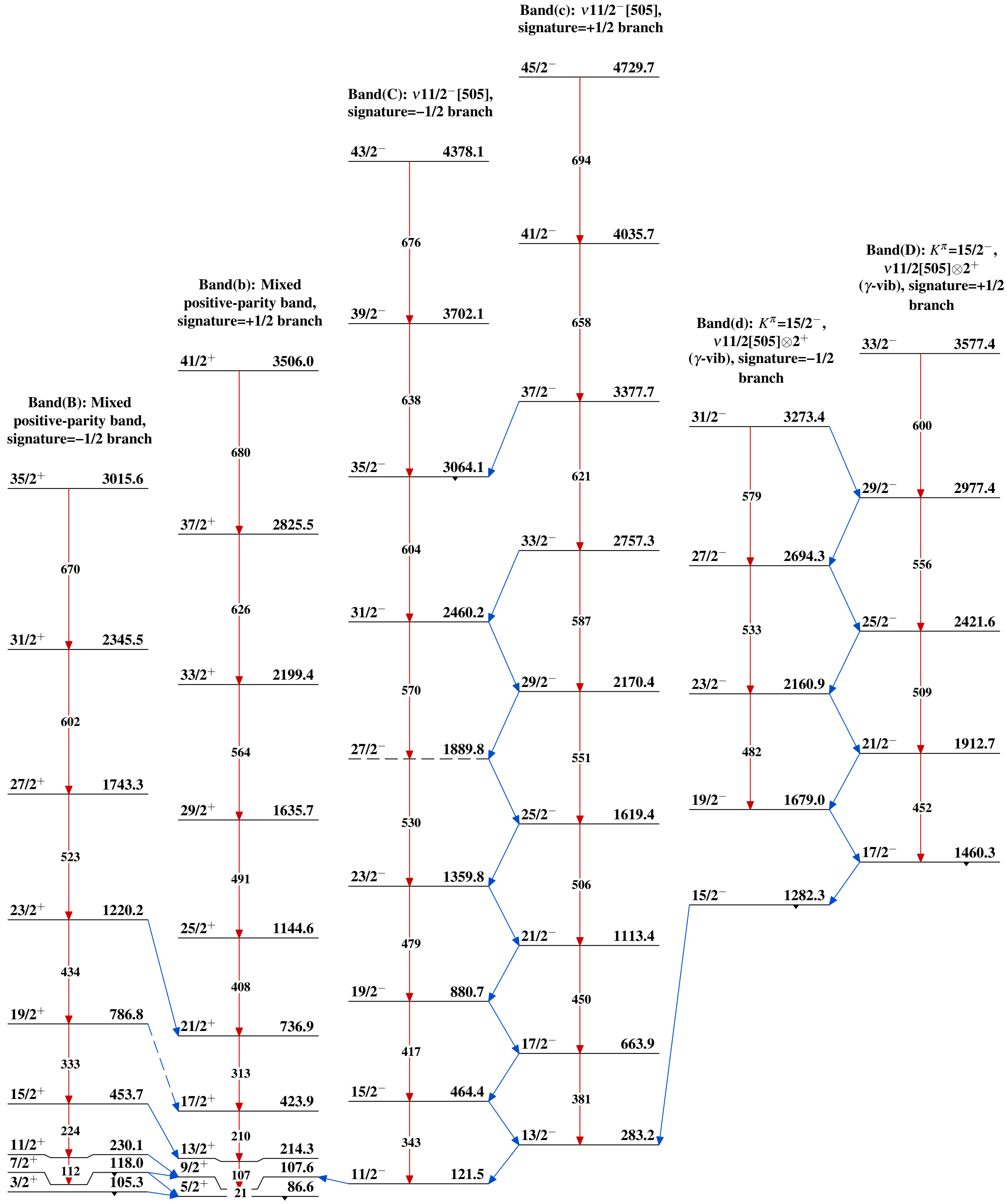
$^{155}_{64}Gd_{91}$

^{154}Sm(α,3nγ) 1970Lo04,1999HuZY,2011Sh08



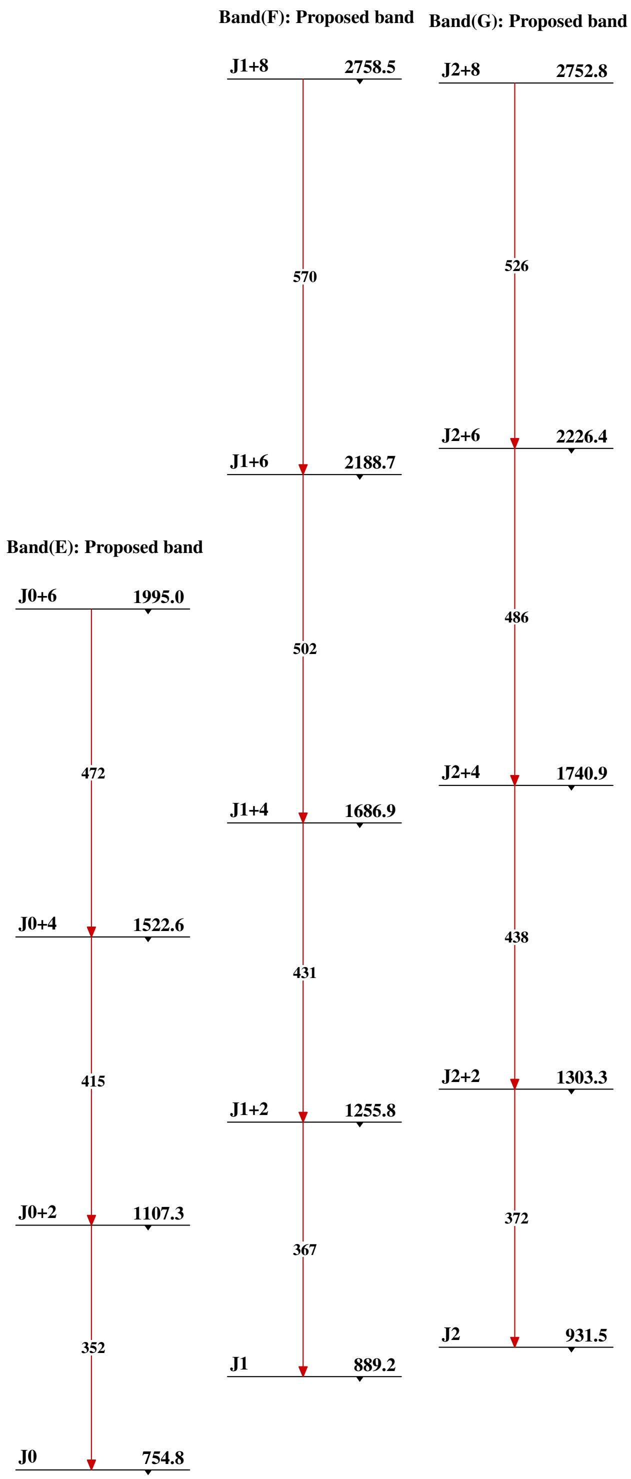
$^{155}_{64}Gd_{91}$

$^{154}Sm(\alpha,3n\gamma)$ 1970Lo04,1999HuZY,2011Sh08 (continued)



$^{155}_{64}Gd_{91}$

$^{154}Sm(\alpha,3n\gamma)$ 1970Lo04,1999HuZY,2011Sh08 (continued)



$^{155}_{64}Gd_{91}$