^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 174,1 (2021)	15-Apr-2021

This datasets contains data for normal-deformed (ND) bands from the measurement of ^{80}Se(^{48}Ca,5nγ). See 2021Ba03 for data of super-deformed bands from the same measurement.

2020Ba12: E=207 MeV ^{48}Ca beam was produced from the ATLAS accelerator at ANL. Target was 0.6 mg/cm^2 ^{80}Se on a 0.3 mg/cm^2 Au backing. γ rays were detected with the Gammasphere array of 101 Compton-suppressed Ge detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma\gamma$-coin, γ angular intensity ratios. Deduced levels, J, π, band structures, γ-ray multipolarities. Comparisons with Cranked Nilsson-Strutinsky (CNS) calculations.

^{123}Xe Levels

E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]
0.0		2822.0[o] *6*	$23/2^+$	5064.5[c] *9*	$(33/2^-)$	7481.7[h] *7*	$45/2^+$
97.38[g] *3*	$3/2^+$	2882.1[n] *6*	$23/2^+$	5066.5[o] *7*	$35/2^+$	7617.4[@] *8*	$45/2^-$
180.76 *4*	$5/2^+$	2950.7[f] *8*	$25/2^-$	5109.4 *11*	$33/2^-$	7780.7 *10*	$45/2^-$
185.31 *20*	$7/2^-$	2963.9[g] *6*	$23/2^+$	5207.4[n] *9*	$35/2^+$	7807.5[m] *20*	$45/2^+$
206.4 *3*	$9/2^-$	2965.3[e] *6*	$27/2^-$	5213.3 *9*	$(35/2^-)$	7840.2 *20*	
252.02[n] *5*	$7/2^+$	2991.2 *6*	$27/2^-$	5285.8 *11*	$(33/2^-)$	7969.8[c] *8*	$45/2^-$
263.41[e] *25*	$11/2^-$	3152.6[b] *8*	$25/2^-$	5328.9[b] *13*	$(33/2^-)$	7990.9[i] *7*	$47/2^+$
306.8 *7*	$5/2^+$	3169.0 *6*	$25/2^+$	5337.8[#] *6*	$35/2^-$	8075.3[#] *9*	$47/2^-$
437.8[g] *8*	$7/2^+$	3209.8[m] *7*	$25/2^+$	5418.0 *8*	$35/2^-$	8189.3 *8*	$47/2^+$
518.5[m] *5*	$9/2^+$	3349.3[i] *6*	$27/2^+$	5519.3[h] *7*	$37/2^+$	8218.2[e] *8*	$47/2^-$
662.1 *6*	$13/2^-$	3478.8[o] *7*	$27/2^+$	5585.3[&] *10*	$35/2^-$	8224.9[&] *8*	$47/2^-$
719.1[e] *6*	$15/2^-$	3559.4[n] *8*	$27/2^+$	5651.0[m] *14*	$37/2^+$	8298.3[o] *9*	$(47/2^+)$
767.6[n] *6*	$11/2^+$	3820.2[h] *6*	$29/2^+$	5687.3 *9*	$35/2^-$	8363.6 *9*	$47/2^-$
877.2[b] *8*	$13/2^-$	3853.7[a] *7*	$(27/2^-)$	5793.4[@] *7*	$37/2^-$	8448.6[n] *14*	$(47/2^+)$
934.8[g] *10*	$11/2^+$	3905.2[m] *9*	$29/2^+$	5915.5[i] *7*	$39/2^+$	8453.6[h] *7*	$49/2^+$
1082.0[m] *6*	$13/2^+$	3907.9[#] *6*	$27/2^-$	6034.1[o] *7*	$39/2^+$	8690.6[@] *9*	$(49/2^-)$
1269.8[a] *7*	$15/2^-$	3951.1[e] *6*	$31/2^-$	6045.8[e] *7*	$39/2^-$	8694.0 *8*	$49/2^+$
1293.6[f] *7*	$17/2^-$	3956.0[f] *9*	$(29/2^-)$	6048.5[f] *10*	$(37/2^-)$	8955.2[c] *8*	$49/2^-$
1335.7[e] *6*	$19/2^-$	4019.1 *7*	$29/2^+$	6070.1[c] *7*	$37/2^-$	8975.1 *15*	$(49/2^-)$
1397.5[n] *7*	$15/2^+$	4103.4[b] *8*	$29/2^-$	6133.8[#] *7*	$39/2^-$	9123.9[i] *7*	$51/2^+$
1522.0[b] *8*	$17/2^-$	4155.6[i] *6*	$31/2^+$	6165.1[n] *9*	$39/2^+$	9257.4[#] *9*	$(51/2^-)$
1553.7[g] *10*	$15/2^+$	4213.1[o] *7*	$31/2^+$	6374.1[&] *8*	$39/2^-$	9356.8[d] *9*	$53/2^-$
1757.5[m] *6*	$17/2^+$	4283.6[@] *7*	$29/2^-$	6418.2 *7*	$39/2^-$	9376.9[&] *13*	$(51/2^-)$
1953.3[a] *6*	$19/2^-$	4325.3[n] *9*	$31/2^+$	6464.9 *7*	$39/2^-$	9418.8[h] *8*	$53/2^+$
2062.1[f] *8*	$21/2^-$	4354.9 *9*	$(31/2^-)$	6477.0[h] *7*	$41/2^+$	9422.8[e] *10*	$51/2^-$
2089.4[e] *6*	$23/2^-$	4608.9[#] *6*	$31/2^-$	6655.2[@] *7*	$41/2^-$	9465.2[p] *11*	
2112.2[n] *6*	$19/2^+$	4627.4[h] *7*	$33/2^+$	6683.8[m] *17*	$41/2^+$	9566.3[o] *14*	$(51/2^+)$
2227.3 *12*	$(23/2^-)$	4724.6[m] *10*	$33/2^+$	6789.2[c] *7*	$41/2^-$	9590.7 *14*	
2230.2[g] *7*	$19/2^+$	4880.0 *7*	$33/2^+$	7066.9[#] *8*	$43/2^-$	9808.9[k] *8*	$(53/2^+)$
2284.4[b] *8*	$21/2^-$	4933.9 *9*	$(33/2^-)$	7084.4[i] *7*	$43/2^+$	9904.2[j] *9*	
2422.1 *8*	$19/2^+$	5010.2[e] *7*	$35/2^-$	7106.9[e] *8*	$43/2^-$	9906.5[@] *9*	$(53/2^-)$
2497.1[m] *6*	$21/2^+$	5026.7[@] *7*	$33/2^-$	7114.9[o] *8*	$43/2^+$	10068.1[i] *8*	$55/2^+$
2688.6 *6*	$21/2^+$	5036.2[i] *7*	$35/2^+$	7257.6[&] *8*	$43/2^-$	10135.1 *9*	$55/2^-$
2769.5[a] *6*	$23/2^-$	5043.2[f] *10*	$(33/2^-)$	7278.8[n] *9*	$43/2^+$	10489.5[#] *10*	$(55/2^-)$

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$^{80}Se(^{48}Ca,5n\gamma)$:Nd 2020Ba12 (continued)

^{123}Xe Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
10574.3& 17	(55/2⁻)	11089.7 10	59/2⁻	11898.0?p		12858.4 13	
10597.0h 9	(57/2⁺)	11097.6k 9	57/2⁺	11998.7e 15	(59/2⁻)	12921.0l 17	
10613.8 9	57/2⁺	11132.7j 9		12039.9 11	61/2⁺	13173.1h 11	(65/2⁺)
10634.4p 15		11175.4i 9	(59/2⁺)	12146.4k 11	61/2⁺	13432.8 11	67/2⁻
10679.8e 14	55/2⁻	11175.7@ 12	(57/2⁻)	12216.2?		13438.4 15	65/2⁻
10708.1o 17	(55/2⁺)	11440.5l 13		12236.4 11	63/2⁻	14484.7 12	
10823.7 9	57/2⁺	11721.2d 10	61/2⁻	12295.6j 11		14521.3 12	
10890.5d 10	57/2⁻	11808.4h 10	(61/2⁺)	12323.8 13		14554.2 18	(69/2⁻)
11046.1 10	57/2⁻	11851.1o 20	(59/2⁺)	12491.9 11	63/2⁻	14760.0 13	69/2⁻

† From a least-squares fit to γ-ray energies, unless otherwise noted.
‡ From 2020Ba12, based on measured γ angular intensity ratios, band structures, and known assignments of low-lying states. When considered in Adopted Levels, firm assignments by 2020Ba12 will be placed inside parentheses if there is lack of firm experimental evidences.
# Band(A): Band 1 based on 27/2⁻, α=−1/2.
@ Band(a): Band 2 based on 29/2⁻, α=+1/2.
& Band(B): Band 3 based on 35/2⁻.
a Band(C): Band 4 based on 15/2⁻.
b Band(D): Band 5 based on 13/2⁻.
c Band(E): Band 6 based on (33/2⁻).
d Band(F): Band 7 based on 53/2⁻.
e Band(G): Band 8 based on 11/2⁻.
f Band(H): Band 9 based on 17/2⁻.
g Band(I): Band 10 based on 3/2⁺.
h Band(J): Band 11 based on 29/2⁺.
i Band(K): Band 12 based on 27/2⁺.
j Band(L): Band 12A based on 9905 level.
k Band(M): Band 12B based on 9810 level.
l Band(N): Band 12C based on 11441 level.
m Band(O): Band 13 based on 9/2⁺.
n Band(P): Band 14 based on 7/2⁺.
o Band(Q): Band 15 based on 23/2⁺.
p Band(R): Band 15A based on 9465 level.

γ(^{123}Xe)

Eγ†	Iγ‡	Ei(level)	Jπi	Ef	Jπf	Mult.b	Comments
21.1# 2		206.4	9/2⁻	185.31	7/2⁻		
57.0# 2		263.41	11/2⁻	206.4	9/2⁻		
66.7# 2		252.02	7/2⁺	185.31	7/2⁻		
71.26# 3		252.02	7/2⁺	180.76	5/2⁺		
78.1# 2		263.41	11/2⁻	185.31	7/2⁻		
83.38# 2		180.76	5/2⁺	97.38	3/2⁺		
97.38# 3		97.38	3/2⁺	0.0			
131.2 10		437.8	7/2⁺	306.8	5/2⁺		
136.5 5	19 3	4155.6	31/2⁺	4019.1	29/2⁺	D+Q	R_θ=0.52 5.

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$^{80}Se(^{48}Ca,5n\gamma)$:Nd 2020Ba12 (continued)

$\gamma(^{123}Xe)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[b]	Comments
139.4 *5*	76 *10*	3349.3	27/2+	3209.8	25/2+	D+Q	R_θ=0.67 *7*.
156.6 *5*	20 *3*	5036.2	35/2+	4880.0	33/2+	D+Q	R_θ=0.56 *6*.
180.4 *2*	3.8×10^2 *4*	3349.3	27/2+	3169.0	25/2+	D+Q	R_θ=0.65 *6*.
180.5 *10*		180.76	5/2+	0.0			
199.4 *5*	17 *2*	11089.7	59/2−	10890.5	57/2−	D+Q	R_θ=0.78 *7*.
205.1 *2*	167 *24*	3169.0	25/2+	2963.9	23/2+		
209.5 *10*		306.8	5/2+	97.38	3/2+		
240.2 *10*	7 *1*	8694.0	49/2+	8453.6	49/2+	D+Q	R_θ=1.07 *12*.
249.0 *10*		767.6	11/2+	518.5	9/2+		
255.1 *10*		518.5	9/2+	263.41	11/2−	D	R_θ=0.93 *11*.
266.2 *10*		518.5	9/2+	252.02	7/2+	D+Q	R_θ=0.63 *6*.
266.3 *10*		2688.6	21/2+	2422.1	19/2+	D+Q	R_θ=0.49 *6*.
275.3 *10*		2963.9	23/2+	2688.6	21/2+	D+Q	R_θ=0.63 *7*.
287.0 *2*	113 *16*	3169.0	25/2+	2882.1	23/2+	D+Q	R_θ=0.60 *5*.
294.6 *5*	10 *2*	9418.8	53/2+	9123.9	51/2+	D+Q	R_θ=0.48 *4*.
306.9 *10*		306.8	5/2+	0.0			
312.2 *10*		518.5	9/2+	206.4	9/2−		
314.2 *10*		1082.0	13/2+	767.6	11/2+		
315.3 *10*		1397.5	15/2+	1082.0	13/2+		
324.6 *5*	43 *5*	6789.2	41/2−	6464.9	39/2−	D+Q	R_θ=0.68 *5*.
325.4 *10*		4608.9	31/2−	4283.6	29/2−		
333.3 *10*		518.5	9/2+	185.31	7/2−		
335.2 *5*	30 *4*	4155.6	31/2+	3820.2	29/2+	D+Q	R_θ=0.72 *7*.
337.8 *10*		518.5	9/2+	180.76	5/2+		
340.2 *10*		437.8	7/2+	97.38	3/2+	Q	R_θ=1.23 *13*.
347.0 *5*	30 *5*	3169.0	25/2+	2822.0	23/2+		
363.1 *10*		1082.0	13/2+	719.1	15/2−		
366.8 *10*		7481.7	45/2+	7114.9	43/2+	D+Q	R_θ=0.71 *6*.
371.1 *5*	19 *2*	6789.2	41/2−	6418.2	39/2−	D+Q	R_θ=0.38 *5*.
375.6 *10*		4283.6	29/2−	3907.9	27/2−	D+Q	R_θ=0.64 *6*.
382.9 *10*	6 *1*	6070.1	37/2−	5687.3	35/2−	D+Q	R_θ=0.67 *13*.
385.1 *5*	64 *8*	3349.3	27/2+	2963.9	23/2+		
392.6 *10*		1269.8	15/2−	877.2	13/2−		
394.8 *5*	11 *2*	6464.9	39/2−	6070.1	37/2−	D+Q	R_θ=0.68 *5*.
396.3[@] *2*	196[a] *24*	5915.5	39/2+	5519.3	37/2+		
396.9[@] *10*	[a]	7481.7	45/2+	7084.4	43/2+		
399.0 *10*		662.1	13/2−	263.41	11/2−		
401.3 *10*		5687.3	35/2−	5285.8	(33/2−)		
401.6 *2*	169 *20*	9356.8	53/2−	8955.2	49/2−	Q	R_θ=1.38 *12*.
403.7 *10*		4354.9	(31/2−)	3951.1	31/2−		
408.6 *5*	17 *2*	5036.2	35/2+	4627.4	33/2+	D+Q	R_θ=0.72 *8*.
417.8 *5*	35 *4*	5026.7	33/2−	4608.9	31/2−	D+Q	R_θ=0.67 *7*.
430.1 *5*	16 *2*	9123.9	51/2+	8694.0	49/2+	D+Q	R_θ=0.92 *10*.
430.9 *10*		1953.3	19/2−	1522.0	17/2−		
455.6 *10*		719.1	15/2−	263.41	11/2−		
455.7 *10*		662.1	13/2−	206.4	9/2−		
455.9 *10*		5793.4	37/2−	5337.8	35/2−	D+Q	R_θ=0.68 *7*.
457.6 *10*		8075.3	47/2−	7617.4	45/2−		
462.7 *2*	111 *12*	8453.6	49/2+	7990.9	47/2+	D+Q	R_θ=0.71 *7*.
466.8 *5*	28 *4*	3349.3	27/2+	2882.1	23/2+		
470.9[@] *2*	190[a] *23*	3820.2	29/2+	3349.3	27/2+		
471.4[@] *10*	[a]	4627.4	33/2+	4155.6	31/2+		
480.3 *2*	107 *15*	3169.0	25/2+	2688.6	21/2+	Q	R_θ=1.39 *16*.
483.2 *2*	109 *13*	5519.3	37/2+	5036.2	35/2+	D+Q	R_θ=0.88 *10*.

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^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12 (continued)

γ(^{123}Xe) (continued)

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult. b	Comments
484.3 10		2769.5	23/2⁻	2284.4	21/2⁻		
497.0 10		934.8	11/2⁺	437.8	7/2⁺		
504.1 10	8 1	8694.0	49/2⁺	8189.3	47/2⁺	D+Q	R_θ=0.66 7.
515.1 5	15 3	12236.4	63/2⁻	11721.2	61/2⁻	D+Q	R_θ=0.76 6.
515.6 10		767.6	11/2⁺	252.02	7/2⁺		
521.7 5	43 6	6655.2	41/2⁻	6133.8	39/2⁻	D+Q	R_θ=0.71 6.
523.1 10		7780.7	45/2⁻	7257.6	43/2⁻	D+Q	R_θ=0.84 8.
534.8 10		12858.4		12323.8			
541.8 10		2963.9	23/2⁺	2422.1	19/2⁺	Q	R_θ=1.29 10.
550.5 5	22 3	7617.4	45/2⁻	7066.9	43/2⁻	D+Q	R_θ=0.59 6.
550.8 10		1269.8	15/2⁻	719.1	15/2⁻	D+Q	R_θ=0.71 7.
555.7 10	2.0 5	3905.2	29/2⁺	3349.3	27/2⁺		
558.4 10		5585.3	35/2⁻	5026.7	33/2⁻	D+Q	R_θ=0.62 7.
561.5 2	3.1×10² 4	6477.0	41/2⁺	5915.5	39/2⁺	D+Q	R_θ=0.59 6.
563.5 10		1082.0	13/2⁺	518.5	9/2⁺		
566.8 5	16 2	9257.4	(51/2⁻)	8690.6	(49/2⁻)	D+Q	R_θ=0.46 5.
574.4 10		1293.6	17/2⁻	719.1	15/2⁻	D+Q	R_θ=0.45 6.
580.8 5	34 5	6374.1	39/2⁻	5793.4	37/2⁻	D+Q	R_θ=0.58 6.
582.7 10	9 1	10489.5	(55/2⁻)	9906.5	(53/2⁻)		
591.4 5	33 4	8955.2	49/2⁻	8363.6	47/2⁻	D+Q	R_θ=0.97 9.
591.5 10		2822.0	23/2⁺	2230.2	19/2⁺		
602.3 5	26 3	7257.6	43/2⁻	6655.2	41/2⁻	D+Q	R_θ=0.82 9.
607.4 2	207 24	7084.4	43/2⁺	6477.0	41/2⁺	D+Q	R_θ=0.58 6.
607.5 5	25 3	8224.9	47/2⁻	7617.4	45/2⁻	D+Q	R_θ=0.60 6.
607.7 10		1269.8	15/2⁻	662.1	13/2⁻	D+Q	R_θ=0.61 6.
608.8 c 10		3559.4	27/2⁺	2950.7	25/2⁻		
613.7 10		877.2	13/2⁻	263.41	11/2⁻	D+Q	R_θ=0.90 10.
614.6 10		8690.6	(49/2⁻)	8075.3	47/2⁻		
616.6 2	1000	1335.7	19/2⁻	719.1	15/2⁻	Q	R_θ=1.46 11.
617.5 10		1953.3	19/2⁻	1335.7	19/2⁻		
619.0 10		1553.7	15/2⁺	934.8	11/2⁺		
629.9 10		1397.5	15/2⁺	767.6	11/2⁺	Q	R_θ=1.34 14.
631.5 5	15 2	11721.2	61/2⁻	11089.7	59/2⁻	D+Q	R_θ=0.63 7.
631.6 10		1293.6	17/2⁻	662.1	13/2⁻	Q	R_θ=1.31 5.
633.1 5	48 6	11808.4	(61/2⁺)	11175.4	(59/2⁺)	D+Q	R_θ=0.73 7.
644.6 10		1522.0	17/2⁻	877.2	13/2⁻		
649.3 5	10 2	9906.5	(53/2⁻)	9257.4	(51/2⁻)		
651.7 10		2882.1	23/2⁺	2230.2	19/2⁺	Q	R_θ=1.37 14.
655.1 5	15 2	6789.2	41/2⁻	6133.8	39/2⁻		
656.8 2	139 18	3478.8	27/2⁺	2822.0	23/2⁺	Q	R_θ=1.37 11.
669.8 10		4019.1	29/2⁺	3349.3	27/2⁺	D+Q	R_θ=0.40 5.
670.1 2	114 13	9123.9	51/2⁺	8453.6	49/2⁺	D+Q	R_θ=0.62 7.
671.8 2	2.5×10² 3	3169.0	25/2⁺	2497.1	21/2⁺		
674.7 10	8 1	11721.2	61/2⁻	11046.1	57/2⁻		
675.8 10		1757.5	17/2⁺	1082.0	13/2⁺		
676.5 10		2230.2	19/2⁺	1553.7	15/2⁺		
677.3 5	27 4	3559.4	27/2⁺	2882.1	23/2⁺	Q	R_θ=1.70 21.
679.7 10		2769.5	23/2⁻	2089.4	23/2⁻	D+Q	R_θ=0.44 5.
683.5 10		1953.3	19/2⁻	1269.8	15/2⁻	Q	R_θ=1.53 14.
684.6 10	6 1	9808.9	(53/2⁺)	9123.9	51/2⁺		
685.6 10	3 1	11175.7	(57/2⁻)	10489.5	(55/2⁻)		
695.6 10	7 1	3905.2	29/2⁺	3209.8	25/2⁺	Q	R_θ=1.78 21.
700.9 2	182 21	4608.9	31/2⁻	3907.9	27/2⁻	Q	R_θ=1.74 20.
703.4 10	9 1	8694.0	49/2⁺	7990.9	47/2⁺		
707.6 10		8189.3	47/2⁺	7481.7	45/2⁺	D+Q	R_θ=0.59 7.

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^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12 (continued)

γ(^{123}Xe) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [b]	Comments
709.7 2	168 22	2822.0	23/2+	2112.2	19/2+	Q	R_θ=1.67 18.
710.7 5	23 4	5337.8	35/2−	4627.4	33/2+		
712.1 5	14 2	7969.8	45/2−	7257.6	43/2−	D+Q	R_θ=0.69 7.
712.2 10		7990.9	47/2+	7278.8	43/2+		
712.4 5	79 10	3209.8	25/2+	2497.1	21/2+	Q	R_θ=1.53 16.
714.7 10		2112.2	19/2+	1397.5	15/2+	Q	R_θ=1.30 15.
719.2 5	34 5	6789.2	41/2−	6070.1	37/2−	Q	R_θ=1.26 14.
724.8 10	6 1	4880.0	33/2+	4155.6	31/2+		
726.9 10		2062.1	21/2−	1335.7	19/2−		
728.9 2	170 20	5337.8	35/2−	4608.9	31/2−	Q	R_θ=1.40 15.
732.7 10		2822.0	23/2+	2089.4	23/2−		
733.6 10		2963.9	23/2+	2230.2	19/2+	Q	R_θ=1.69 24.
734.3 2	123 16	4213.1	31/2+	3478.8	27/2+	Q	R_θ=1.30 16.
735.7 10		1397.5	15/2+	662.1	13/2−		
737.3 5	55 7	8955.2	49/2−	8218.2	47/2−	D+Q	R_θ=0.82 11.
738.9 2	2.1×10^2 3	3907.9	27/2−	3169.0	25/2+	D	R_θ=0.77 13.
739.6 2	119 15	2497.1	21/2+	1757.5	17/2+	Q	R_θ=1.33 17.
743.0 5	71 9	5026.7	33/2−	4283.6	29/2−	Q	R_θ=1.71 19.
753.8 2	8.8×10^2 8	2089.4	23/2−	1335.7	19/2−	Q	R_θ=1.43 15.
753.8 10		5687.3	35/2−	4933.9	(33/2−)		
755.1 10		4608.9	31/2−	3853.7	(27/2−)		
755.3 10		10890.5	57/2−	10135.1	55/2−		
757.0 5	48 6	5793.4	37/2−	5036.2	35/2+		
762.7 10		2284.4	21/2−	1522.0	17/2−	Q	R_θ=1.38 17.
763.9 10		2991.2	27/2−	2227.3	(23/2−)		
765.9 5	31 4	4325.3	31/2+	3559.4	27/2+	Q	R_θ=1.35 24.
766.5 5	51 6	5793.4	37/2−	5026.7	33/2−	Q	R_θ=1.70 19.
768.5 10		2062.1	21/2−	1293.6	17/2−	Q	R_θ=1.56 17.
770.3 5	62 8	2882.1	23/2+	2112.2	19/2+	Q	R_θ=1.41 16.
777.7 10		6464.9	39/2−	5687.3	35/2−	Q	R_θ=1.20 15.
778.3 2	127 14	10135.1	55/2−	9356.8	53/2−	D+Q	R_θ=0.65 8.
780.2 5	30 5	9904.2		9123.9	51/2+		
788.6 10		6374.1	39/2−	5585.3	35/2−	Q	R_θ=1.26 16.
788.7 5	26 4	4608.9	31/2−	3820.2	29/2+	D	R_θ=0.95 18.
796.0 2	132 15	6133.8	39/2−	5337.8	35/2−	Q	R_θ=1.40 15.
802.8 10		1522.0	17/2−	719.1	15/2−		
806.3[@] 2	4.4×10^2[a] 5	4155.6	31/2+	3349.3	27/2+		
807.4[@&] 10	[a]	4627.4	33/2+	3820.2	29/2+		
816.1 2	2.6×10^2 3	2769.5	23/2−	1953.3	19/2−	Q	R_θ=1.31 15.
818.6 10		1082.0	13/2+	263.41	11/2−		
819.4 10		2112.2	19/2+	1293.6	17/2−		
819.4 5	18 3	4724.6	33/2+	3905.2	29/2+	Q	R_θ=1.88 27.
820.0 10		2882.1	23/2+	2062.1	21/2−		
830.6 5	19 2	4933.9	(33/2−)	4103.4	29/2−		
830.6 5	30 3	11721.2	61/2−	10890.5	57/2−	Q	R_θ=1.54 19.
848.7 10	9 1	5915.5	39/2+	5066.5	35/2+		
850.5 5	40 8	4019.1	29/2+	3169.0	25/2+	Q	R_θ=1.31 18.
853.3 2	105 13	5066.5	35/2+	4213.1	31/2+	Q	R_θ=1.46 19.
858.6 10		5213.3	(35/2−)	4354.9	(31/2−)		
861.1 10		2950.7	25/2−	2089.4	23/2−	D	
861.3 5	54 9	4880.0	33/2+	4019.1	29/2+	Q	R_θ=1.68 24.
861.5 5	33 4	6655.2	41/2−	5793.4	37/2−	Q	R_θ=1.69 21.
862.1 10		3853.7	(27/2−)	2991.2	27/2−		
868.2 2	134 15	3152.6	25/2−	2284.4	21/2−	Q	R_θ=1.60 22.
871.1 10		5026.7	33/2−	4155.6	31/2+		

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^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12 (continued)

γ(^{123}Xe) (continued)

Eγ[†]	Iγ[‡]	Ei(level)	$J^π_i$	Ef	$J^π_f$	Mult.[b]	Comments
875.3 *10*		2963.9	23/2+	2089.4	23/2−		
875.8 *10*		7990.9	47/2+	7114.9	43/2+		
875.9 *2*	4.1×10^2 *5*	2965.3	27/2−	2089.4	23/2−	Q	$R_θ$=1.49 *18*.
879.2[@] *2*	7.3×10^2[a] *9*	5915.5	39/2+	5036.2	35/2+		
880.8[@] *10*	[a]	5036.2	35/2+	4155.6	31/2+		
882.2 *5*	25 *4*	5207.4	35/2+	4325.3	31/2+	Q	$R_θ$=1.40 *20*.
883.7 *10*		7257.6	43/2−	6374.1	39/2−		
887.8 *10*		3853.7	(27/2−)	2965.3	27/2−		
888.6 *2*	141 *17*	2950.7	25/2−	2062.1	21/2−	Q	$R_θ$=1.89 *27*.
891.8 *2*	100 *12*	5519.3	37/2+	4627.4	33/2+	Q	$R_θ$=1.29 *18*.
901.9 *10*		2991.2	27/2−	2089.4	23/2−	Q	$R_θ$=1.84 *25*.
906.4 *2*	113 *14*	7990.9	47/2+	7084.4	43/2+	Q	$R_θ$=1.43 *18*.
910.9 *5*	20 *2*	11046.1	57/2−	10135.1	55/2−	D+Q	$R_θ$=0.83 *12*.
916.7 *2*	142 *17*	3907.9	27/2−	2991.2	27/2−		
919.2 *10*	5 *1*	7084.4	43/2+	6165.1	39/2+		
926.4 *10*	9 *2*	5651.0	37/2+	4724.6	33/2+	Q	$R_θ$=1.71 *21*.
933.1 *5*	68 *8*	7066.9	43/2−	6133.8	39/2−	Q	$R_θ$=1.48 *19*.
934.2 *10*		4283.6	29/2−	3349.3	27/2+	D	$R_θ$=0.74 *9*.
934.9 *5*	29 *4*	9123.9	51/2+	8189.3	47/2+	Q	$R_θ$=1.23 *18*.
936.1 *10*		2230.2	19/2+	1293.6	17/2−		
939.9 *10*	4 *1*	3905.2	29/2+	2965.3	27/2−		
941.0 *5*	14 *2*	13432.8	67/2−	12491.9	63/2−	Q	$R_θ$=1.45 *19*.
942.6 *2*	3.0×10^2 *4*	3907.9	27/2−	2965.3	27/2−	D+Q	$R_θ$=1.08 *12*.
944.3 *5*	98 *12*	10068.1	55/2+	9123.9	51/2+	Q	$R_θ$=1.53 *23*.
948.9 *10*		2284.4	21/2−	1335.7	19/2−	D+Q	$R_θ$=1.08 *15*.
950.9 *5*	86 *10*	4103.4	29/2−	3152.6	25/2−	Q	$R_θ$=1.48 *22*.
954.6 *5*	40 *5*	11089.7	59/2−	10135.1	55/2−	Q	$R_θ$=1.70 *23*.
957.7 *5*	15 *2*	6165.1	39/2+	5207.4	35/2+	Q	$R_θ$=1.48 *22*.
958.1 *5*	89 *11*	6477.0	41/2+	5519.3	37/2+	Q	$R_θ$=1.40 *21*.
960.6 *10*		6070.1	37/2−	5109.4	33/2−	Q	$R_θ$=1.62 *24*.
960.8 *5*	42[a] *6*	8218.2	47/2−	7257.6	43/2−		
961.3 *10*		5064.5	(33/2−)	4103.4	29/2−		
962.5 *10*	[a]	7617.4	45/2−	6655.2	41/2−	Q	$R_θ$=1.62 *21*.
965.4 *5*	65 *8*	9418.8	53/2+	8453.6	49/2+	Q	$R_θ$=1.63 *21*.
966.7 *10*		8224.9	47/2−	7257.6	43/2−		
967.6 *2*	117 *15*	6034.1	39/2+	5066.5	35/2+	Q	$R_θ$=1.54 *20*.
971.9 *2*	112 *13*	8453.6	49/2+	7481.7	45/2+	Q	$R_θ$=1.76 *23*.
985.0 *10*		8955.2	49/2−	7969.8	45/2−		
985.8 *2*	2.8×10^2 *3*	3951.1	31/2−	2965.3	27/2−	Q	$R_θ$=1.52 *15*.
1000.1 *5*	16 *2*	6418.2	39/2−	5418.0	35/2−	Q	$R_θ$=1.34 *16*.
1004.7 *2*	102 *12*	7481.7	45/2+	6477.0	41/2+	Q	$R_θ$=1.59 *22*.
1005.3[@] *2*	118[a] *15*	6048.5	(37/2−)	5043.2	(33/2−)		
1005.4[@] *10*	[a]	3956.0	(29/2−)	2950.7	25/2−		
1005.7 *5*	35 *4*	6070.1	37/2−	5064.5	(33/2−)		
1008.4 *5*	54 *7*	8075.3	47/2−	7066.9	43/2−	Q	$R_θ$=1.32 *20*.
1027.3 *10*		6070.1	37/2−	5043.2	(33/2−)		
1029.6 *5*	21 *4*	11097.6	57/2+	10068.1	55/2+	D+Q	$R_θ$=0.58 *10*.
1032.8 *10*	7 *1*	6683.8	41/2+	5651.0	37/2+	Q	$R_θ$=1.26 *13*.
1035.6 *2*	129 *14*	6045.8	39/2−	5010.2	35/2−	Q	$R_θ$=1.37 *15*.
1038.3 *10*		1757.5	17/2+	719.1	15/2−	D	$R_θ$=0.85 *11*.
1048.8 *5*	12 *2*	12146.4	61/2+	11097.6	57/2+	Q	$R_θ$=1.58 *22*.
1050.2 *5*	36 *4*	7084.4	43/2+	6034.1	39/2+	Q	$R_θ$=1.51 *21*.
1059.1 *2*	2.4×10^2[a] *3*	5010.2	35/2−	3951.1	31/2−	Q	$R_θ$=1.83 *24*.
1060.9 *10*	[a]	7106.9	43/2−	6045.8	39/2−	Q	$R_θ$=1.55 *20*.

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^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12 (continued)

γ(^{123}Xe) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[b]	Comments
1062.7 *10*		3152.6	25/2⁻	2089.4	23/2⁻		
1064.7 *5*	15 *3*	11132.7		10068.1	55/2⁺		
1073.2 *5*	18 *3*	8690.6	(49/2⁻)	7617.4	45/2⁻		
1079.6 *2*	4.1×10^2 *5*	3169.0	25/2⁺	2089.4	23/2⁻	D	R_θ=0.80 *9*.
1080.7 *5*	58 *8*	7114.9	43/2⁺	6034.1	39/2⁺	Q	R_θ=1.29 *22*.
1084.5 *5*	47 *6*	3853.7	(27/2⁻)	2769.5	23/2⁻		
1087.3 *5*	34 *5*	5043.2	(33/2⁻)	3956.0	(29/2⁻)		
1105.4 *10*		8189.3	47/2⁺	7084.4	43/2⁺	Q	R_θ=1.66 *28*.
1107.3 *5*	41 *6*	11175.4	(59/2⁺)	10068.1	55/2⁺		
1111.4 *5*	76 *8*	8218.2	47/2⁻	7106.9	43/2⁻	Q	R_θ=1.76 *23*.
1113.7 *5*	10 *2*	7278.8	43/2⁺	6165.1	39/2⁺	Q	R_θ=1.22 *22*.
1115.8 *10*	7 *1*	14554.2	(69/2⁻)	13438.4	65/2⁻		
1118.1 *5*	21 *3*	8224.9	47/2⁻	7106.9	43/2⁻		
1120.8 *5*	34 *4*	3209.8	25/2⁺	2089.4	23/2⁻		
1123.7 *10*		7807.5	45/2⁺	6683.8	41/2⁺	Q	R_θ=1.87 *34*.
1126.9[c] *10*	3 *1*	12216.2?		11089.7	59/2⁻		
1128.1 *10*		2422.1	19/2⁺	1293.6	17/2⁻	D	R_θ=0.80 *9*.
1133.3 *5*	18 *2*	9123.9	51/2⁺	7990.9	47/2⁺	Q	R_θ=1.67 *21*.
1137.1 *10*		12858.4		11721.2	61/2⁻		
1138.3 *2*	147 *18*	3907.9	27/2⁻	2769.5	23/2⁻	Q	R_θ=1.60 *21*.
1141.8[@] *10*	8[a] *2*	10708.1	(55/2⁺)	9566.3	(51/2⁺)		
1143.0[@] *10*	[a]	11851.1	(59/2⁺)	10708.1	(55/2⁺)		
1146.5 *10*	8 *1*	12236.4	63/2⁻	11089.7	59/2⁻	Q	R_θ=1.86 *27*.
1152.0 *10*		9376.9	(51/2⁻)	8224.9	47/2⁻		
1153.2 *10*		5109.4	33/2⁻	3956.0	(29/2⁻)		
1156.4 *10*		7840.2		6683.8	41/2⁺		
1160.9 *5*	68 *9*	2497.1	21/2⁺	1335.7	19/2⁻		
1162.9 *5*	14 *3*	12295.6		11132.7			
1166.9 *5*	10[a] *2*	9465.2		8298.3	(47/2⁺)		
1168.8 *5*	85 *10*	7084.4	43/2⁺	5915.5	39/2⁺	Q	R_θ=1.47 *19*.
1169.2 *10*	[a]	10634.4		9465.2			
1169.8 *10*	3 *1*	8448.6	(47/2⁺)	7278.8	43/2⁺		
1174.5 *10*		8955.2	49/2⁻	7780.7	45/2⁻		
1178.2 *5*	11 *2*	10597.0	(57/2⁺)	9418.8	53/2⁺		
1180.6 *5*	58 *7*	7969.8	45/2⁻	6789.2	41/2⁻	Q	R_θ=1.22 *12*.
1182.2 *5*	26 *4*	9257.4	(51/2⁻)	8075.3	47/2⁻		
1183.4 *5*	28 *4*	8298.3	(47/2⁺)	7114.9	43/2⁺		
1194.4 *10*		8975.1	(49/2⁻)	7780.7	45/2⁻		
1195.0 *5*	11 *2*	10613.8	57/2⁺	9418.8	53/2⁺	Q	R_θ=1.47 *22*.
1196.0 *10*	6 *1*	13432.8	67/2⁻	12236.4	63/2⁻		
1197.4 *10*		10574.3	(55/2⁻)	9376.9	(51/2⁻)		
1202.0 *10*		13438.4	65/2⁻	12236.4	63/2⁻	D+Q	R_θ=0.28 *8*.
1204.6 *5*	35 *4*	9422.8	51/2⁻	8218.2	47/2⁻	Q	R_θ=1.23 *18*.
1211.3 *10*		11808.4	(61/2⁺)	10597.0	(57/2⁺)		
1212.7 *5*	17 *2*	8694.0	49/2⁺	7481.7	45/2⁺		
1215.7 *5*	13 *2*	9906.5	(53/2⁻)	8690.6	(49/2⁻)		
1216.2 *5*	16 *2*	12039.9	61/2⁺	10823.7	57/2⁺	Q	R_θ=1.73 *29*.
1222.1[c] *10*		13438.4	65/2⁻	12216.2?			
1225.5 *10*		5328.9	(33/2⁻)	4103.4	29/2⁻		
1228.3 *10*		11132.7		9904.2			
1232.0 *5*	14 *3*	10489.5	(55/2⁻)	9257.4	(51/2⁻)		
1234.2 *10*		12323.8		11089.7	59/2⁻		
1251.9 *10*		6464.9	39/2⁻	5213.3	(35/2⁻)		
1256.6 *5*	29[a] *4*	8363.6	47/2⁻	7106.9	43/2⁻		

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^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12 (continued)

γ(^{123}Xe) (continued)

Eγ[†]	Iγ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[b]	Comments
1257.0 *10*	[a]	10679.8	55/2⁻	9422.8	51/2⁻	Q	R_θ=1.26 *20*.
1262.5 *10*		5213.3	(35/2⁻)	3951.1	31/2⁻		
1264.0[c] *10*		11898.0?		10634.4			
1268.0 *10*	9 *2*	9566.3	(51/2⁺)	8298.3	(47/2⁺)		
1269.9 *10*	6 *1*	11175.7	(57/2⁻)	9906.5	(53/2⁻)		
1288.5 *10*	6 *1*	11097.6	57/2⁺	9808.9	(53/2⁺)		
1292.4 *10*		9590.7		8298.3	(47/2⁺)		
1311.6 *5*	20 *3*	14484.7		13173.1	(65/2⁺)		
1318.9 *5*	14 *2*	11998.7	(59/2⁻)	10679.8	55/2⁻		
1327.2 *5*	10 *2*	14760.0	69/2⁻	13432.8	67/2⁻	D+Q	R_θ=0.24 *7*.
1329.5 *10*		5285.8	(33/2⁻)	3956.0	(29/2⁻)		
1348.2 *5*	27 *3*	14521.3		13173.1	(65/2⁺)		
1352.4 *10*		2688.6	21/2⁺	1335.7	19/2⁻		
1355.3 *5*	11 *2*	9808.9	(53/2⁺)	8453.6	49/2⁺		
1364.7 *5*	58 *6*	13173.1	(65/2⁺)	11808.4	(61/2⁺)		
1372.4 *10*		11440.5		10068.1	55/2⁺		
1389.9 *10*		4354.9	(31/2⁻)	2965.3	27/2⁻		
1402.3 *5*	14 *2*	12491.9	63/2⁻	11089.7	59/2⁻	Q	R_θ=1.78 *28*.
1404.9 *5*	33 *5*	10823.7	57/2⁺	9418.8	53/2⁺	Q	R_θ=1.84 *30*.
1408.2 *5*	11 *2*	6418.2	39/2⁻	5010.2	35/2⁻		
1454.7 *5*	31 *7*	6464.9	39/2⁻	5010.2	35/2⁻	Q	R_θ=1.76 *18*.
1466.6 *10*		5418.0	35/2⁻	3951.1	31/2⁻		
1480.5 *10*	7 *2*	12921.0		11440.5			
1534.0 *10*	9 *2*	10890.5	57/2⁻	9356.8	53/2⁻		
1764.1 *10*		3853.7	(27/2⁻)	2089.4	23/2⁻		
1818.9 *5*	73 *15*	3907.9	27/2⁻	2089.4	23/2⁻		

[†] From 2020Ba12. Uncertainties are not explicitly given by 2020Ba12 and assigned by the evaluator as follows based on authors′ general statement that the uncertainty lies between 0.2 and 1.0 keV depending on intensity: ΔEγ=0.2 keV for Iγ≥100, 0.5 keV for Iγ≥10, and 1.0 keV for the rest, unless otherwise noted.

[‡] Relative to Iγ=1000 for 616.6γ from 1335 level (2020Ba12).

[#] From Adopted Gammas; not seen in 2020Ba12. Original values quoted by 2020Ba12 are taken by the authors from 1981Lu01 in (^{3}He,3nγ).

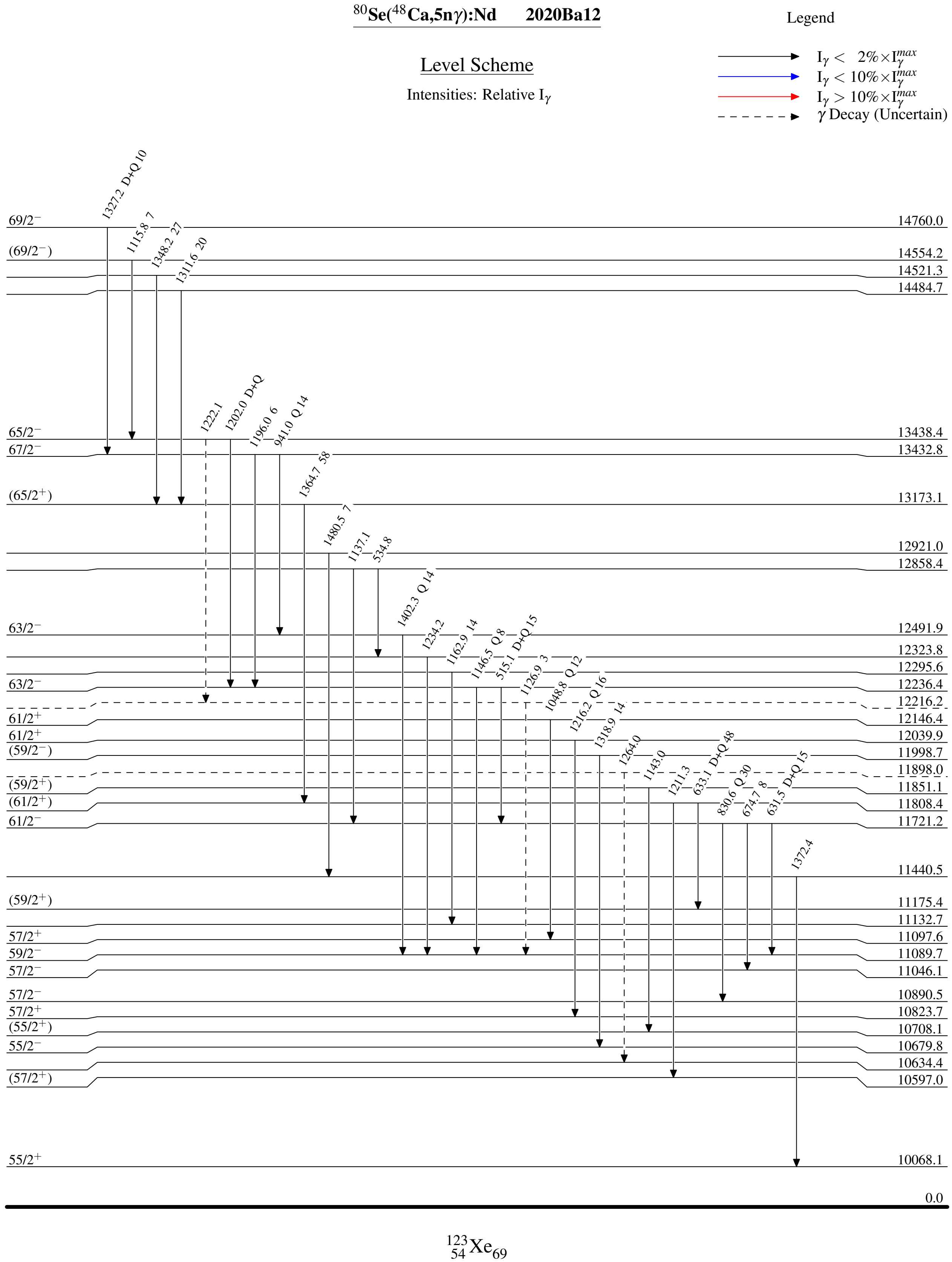
[@] Measurement of angular distribution ratio was not possible due to the presence of gamma rays of overlapping energy (2020Ba12).

[&] The energy of gamma ray could not be measured exactly due to the presence of multiple gamma rays of similar energy (2020Ba12).

[a] The quoted intensity is the combined value for gamma rays of overlapping energies (2020Ba12).

[b] From 2020Ba12 based on measured γ angular intensity ratios R_θ given under comments. Expected R_θ values are ≈0.6 and 1.4 for stretched dipole and stretched quadrupole transitions, respectively. Original assignments are given by 2020Ba12 as M1+E2, E1 and E2 with definite electric or magnetic natures, but have been replaced by the evaluator with D+Q, D and Q, respectively, due to lack of experimental evidence from this work for the electric or magnetic natures.

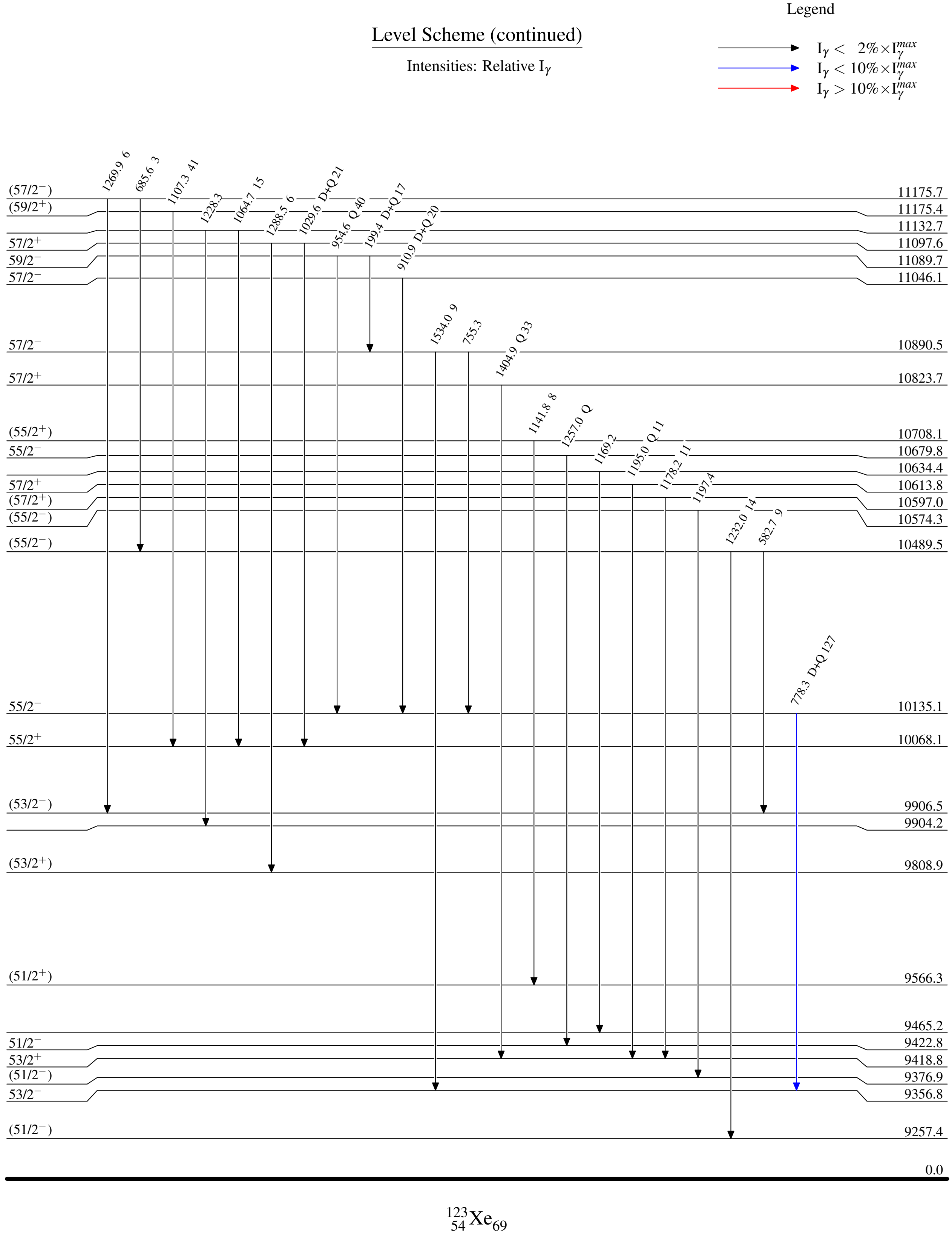
[c] Placement of transition in the level scheme is uncertain.


^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12
Level Scheme
Intensities: Relative Iγ
Legend
Iγ < 2%×Iγ max
Iγ < 10%×Iγ max
Iγ > 10%×Iγ max
γ Decay (Uncertain)
69/2− 14760.0
(69/2−) 14554.2
14521.3
14484.7
65/2− 13438.4
67/2− 13432.8
(65/2+) 13173.1
12921.0
12858.4
63/2− 12491.9
12323.8
12295.6
63/2− 12236.4
12216.2
61/2+ 12146.4
61/2+ 12039.9
(59/2−) 11998.7
11898.0
(59/2+) 11851.1
(61/2+) 11808.4
61/2− 11721.2
11440.5
(59/2+) 11175.4
11132.7
57/2+ 11097.6
59/2− 11089.7
57/2− 11046.1
57/2− 10890.5
57/2+ 10823.7
(55/2+) 10708.1
55/2− 10679.8
10634.4
(57/2+) 10597.0
55/2+ 10068.1
0.0
1327.2 D+Q 10
1115.8 7
1348.2 27
1311.6 20
1222.1
1202.0 D+Q
1196.0 6
941.0 Q 14
1364.7 58
1480.5 7
1137.1
534.8
1402.3 Q 14
1234.2
1162.9 14
1146.5 Q 8
515.1 D+Q 15
1126.9 3
1048.8 Q 12
1216.2 Q 16
1318.9 14
1264.0
1143.0
1211.3
633.1 D+Q 48
830.6 Q 30
674.7 8
631.5 D+Q 15
1372.4
$^{123}_{54}$Xe$_{69}$

^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12

Level Scheme (continued)

Intensities: Relative I_γ



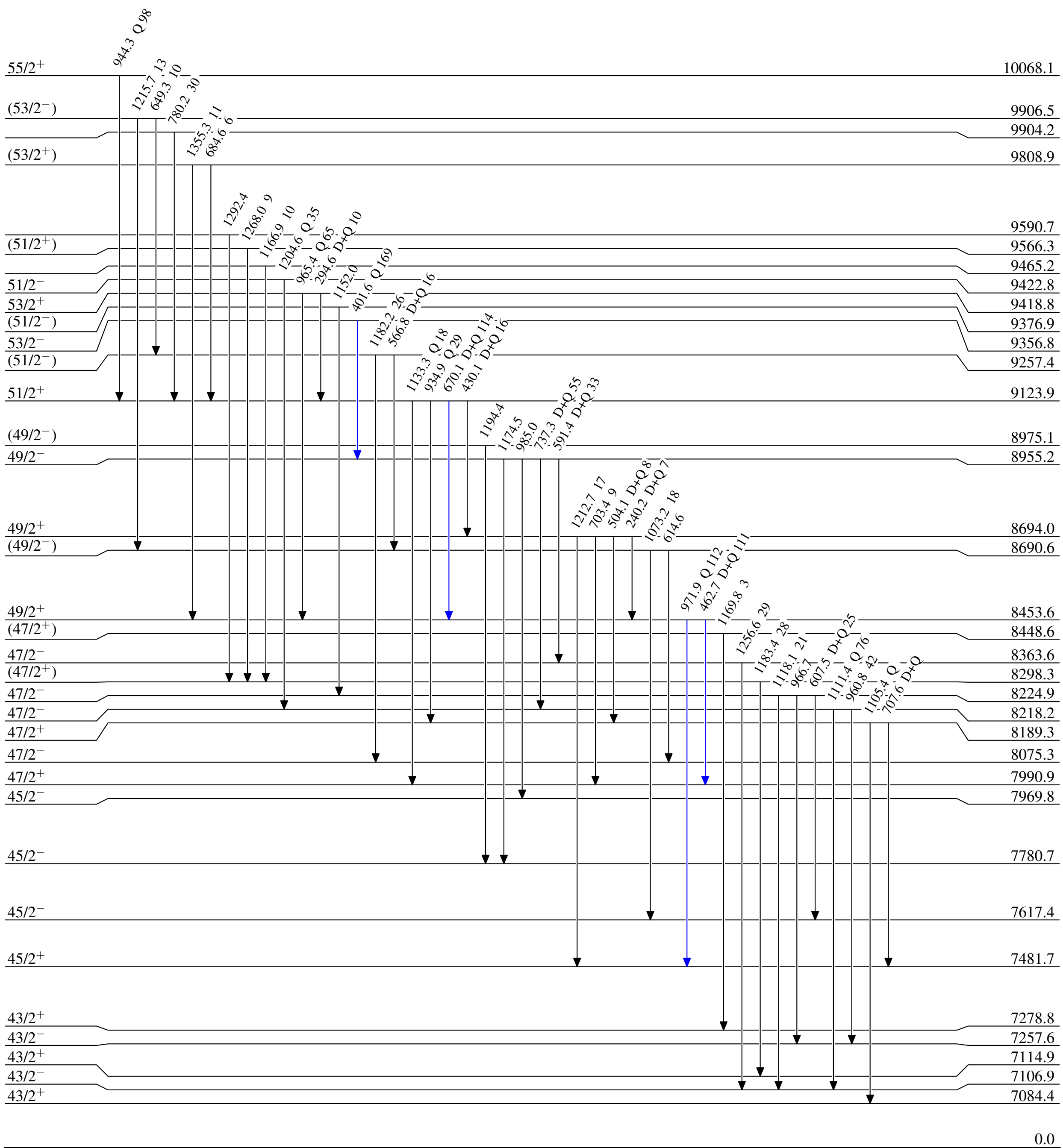
$^{80}Se(^{48}Ca,5n\gamma)$:Nd 2020Ba12

Level Scheme (continued)

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$

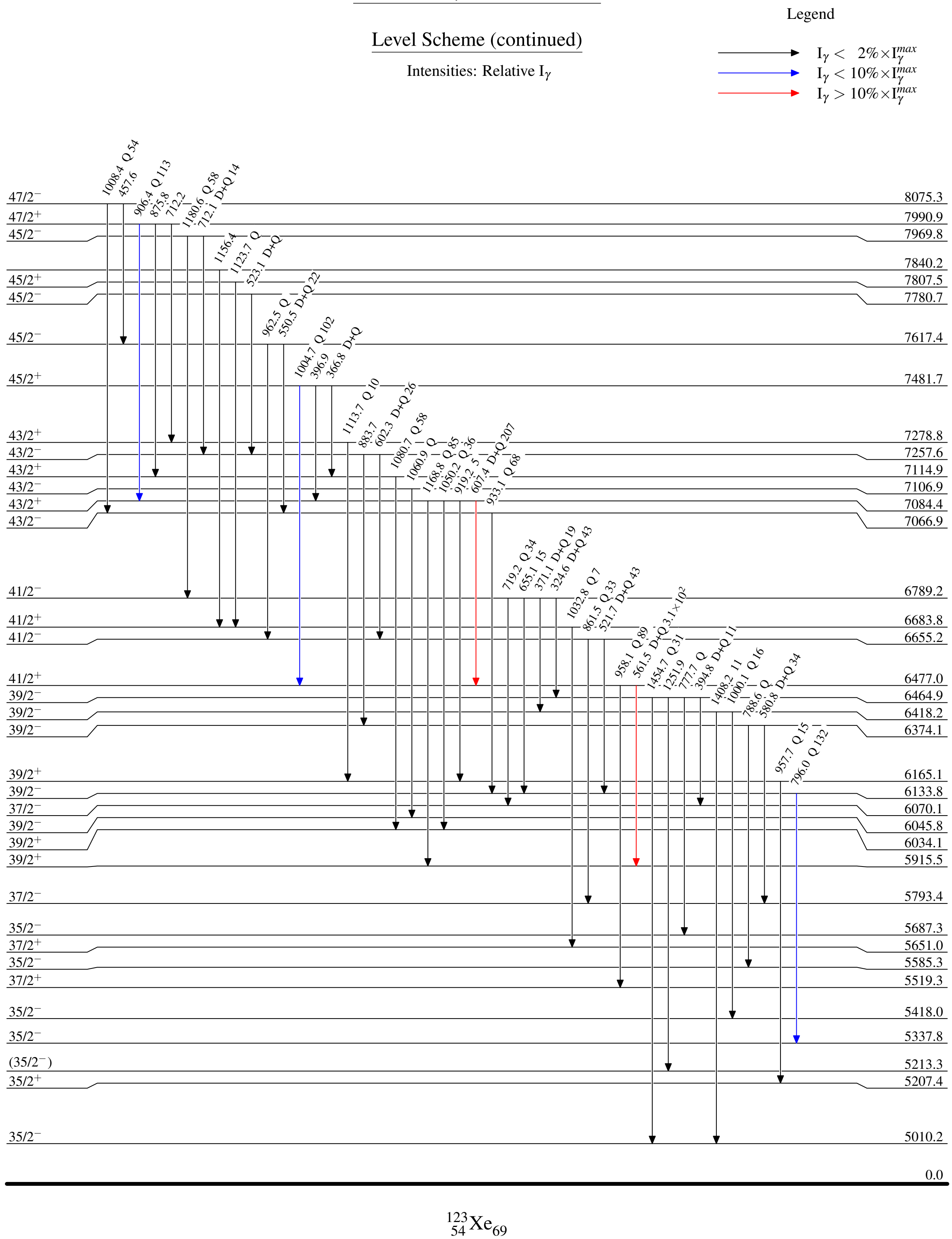


$^{123}_{54}Xe_{69}$

^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12

Level Scheme (continued)

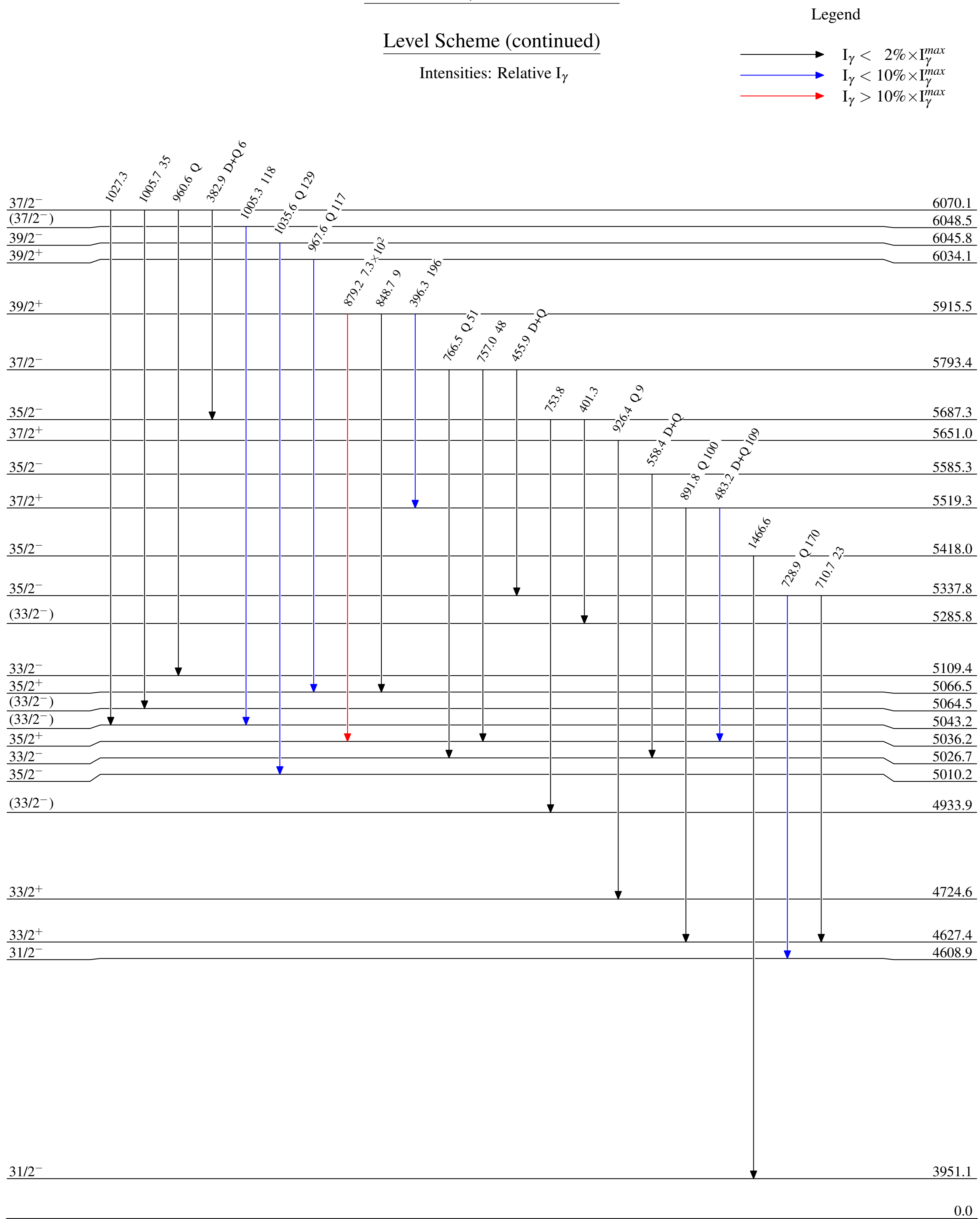
Intensities: Relative I_γ



^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12

Level Scheme (continued)

Intensities: Relative I_γ

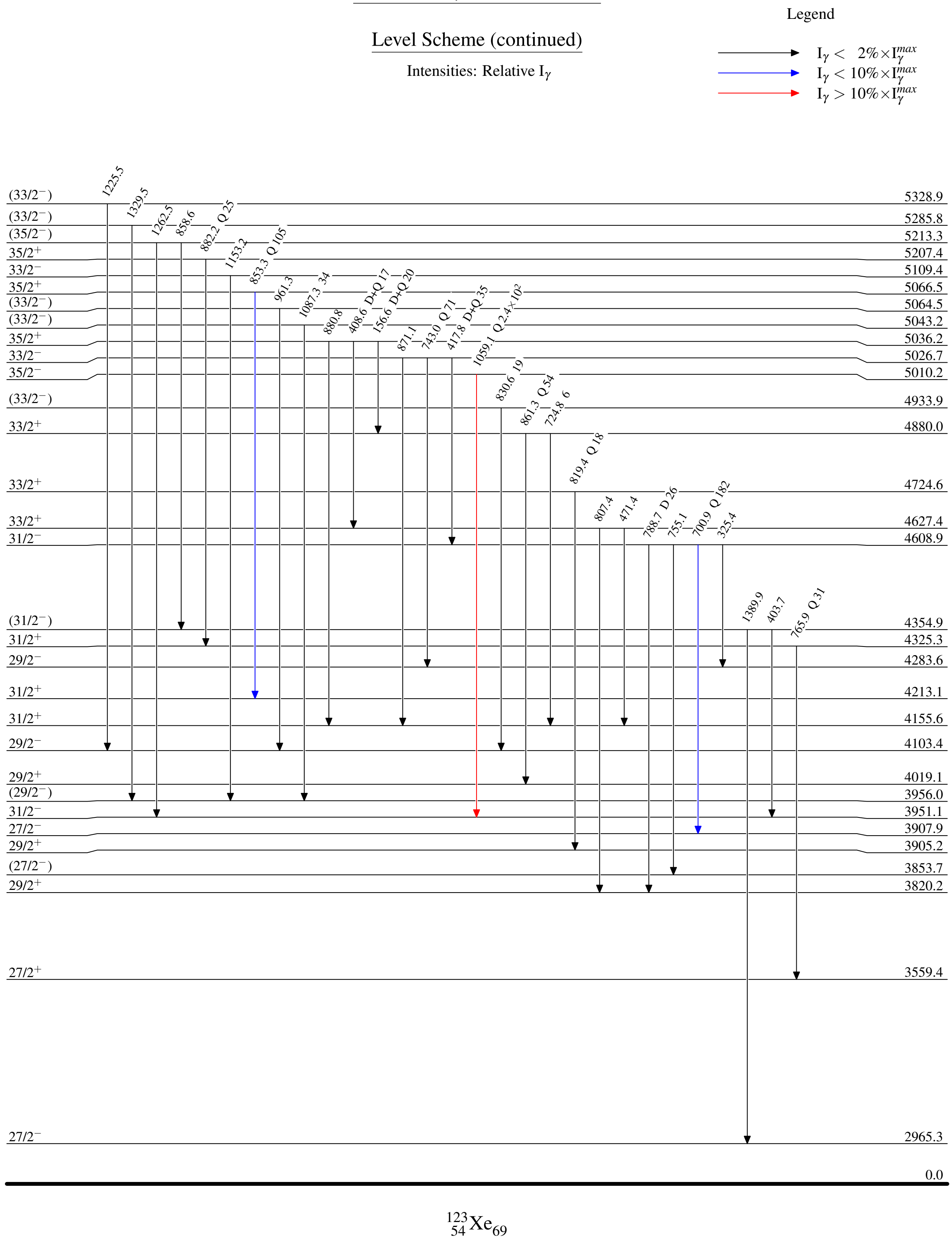


$^{123}_{54}Xe_{69}$

$^{80}Se(^{48}Ca,5n\gamma)$:Nd 2020Ba12

Level Scheme (continued)

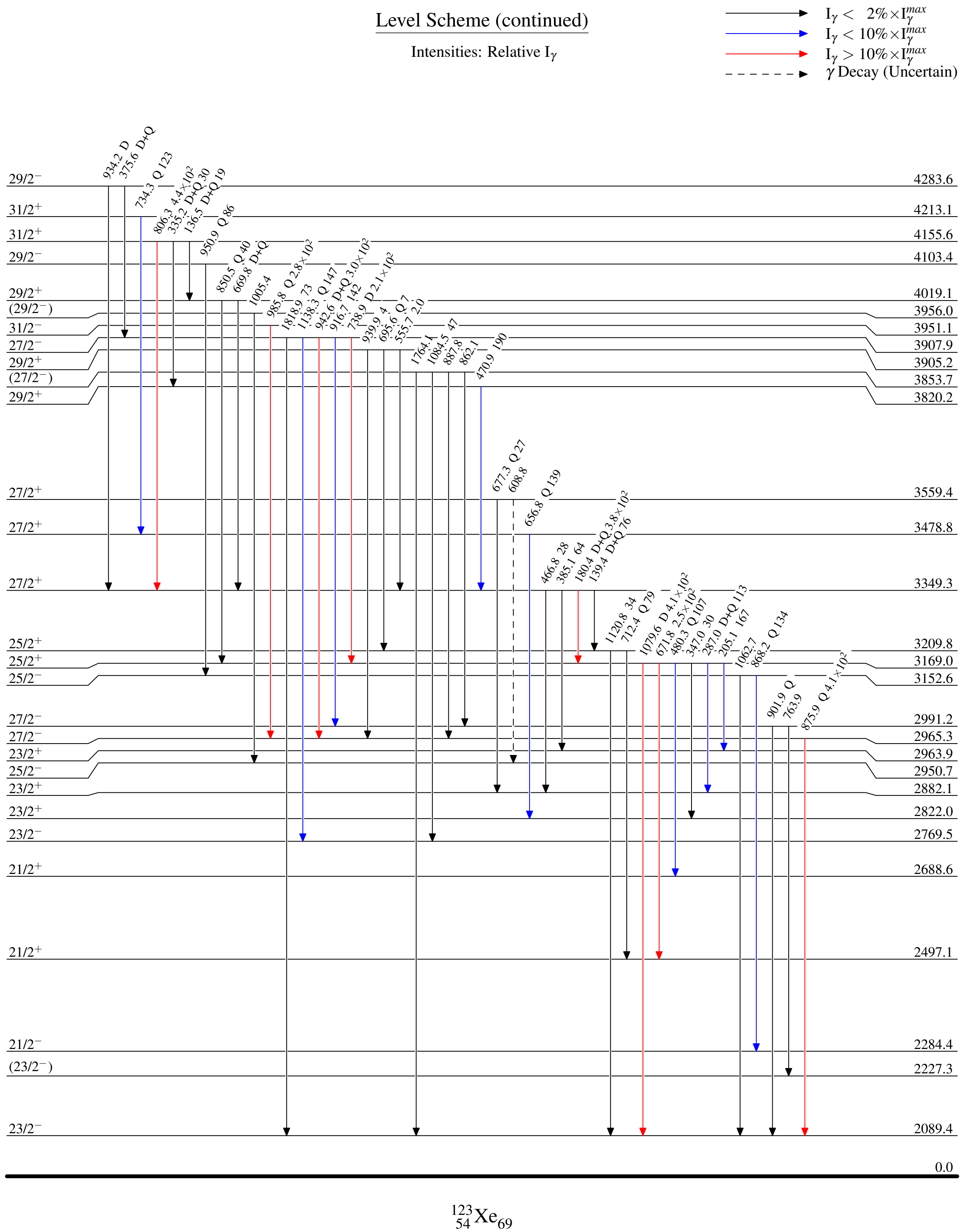
Intensities: Relative I_γ



^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12

Level Scheme (continued)

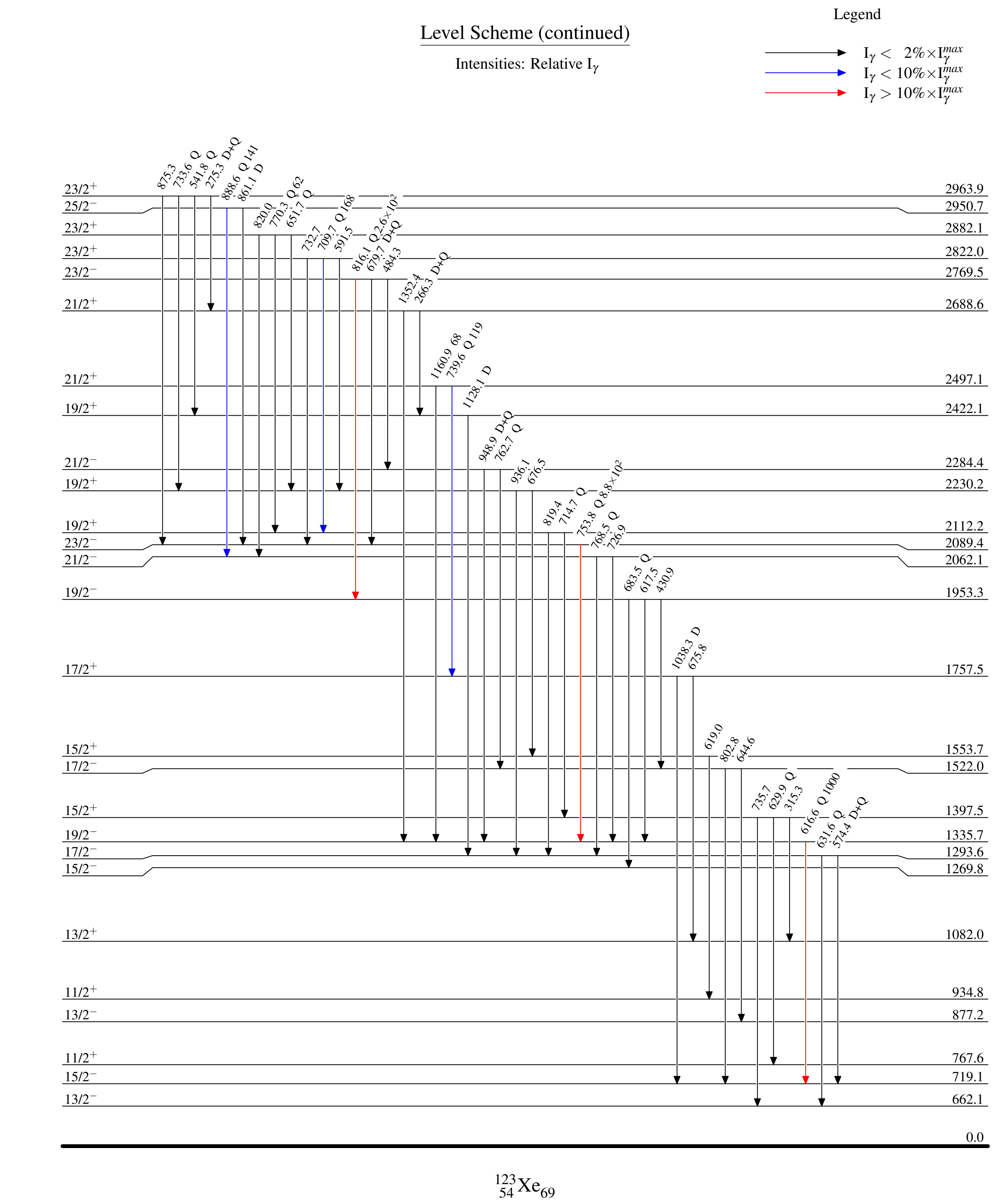
Intensities: Relative I_γ



$^{80}Se(^{48}Ca,5n\gamma)$:Nd 2020Ba12

Level Scheme (continued)

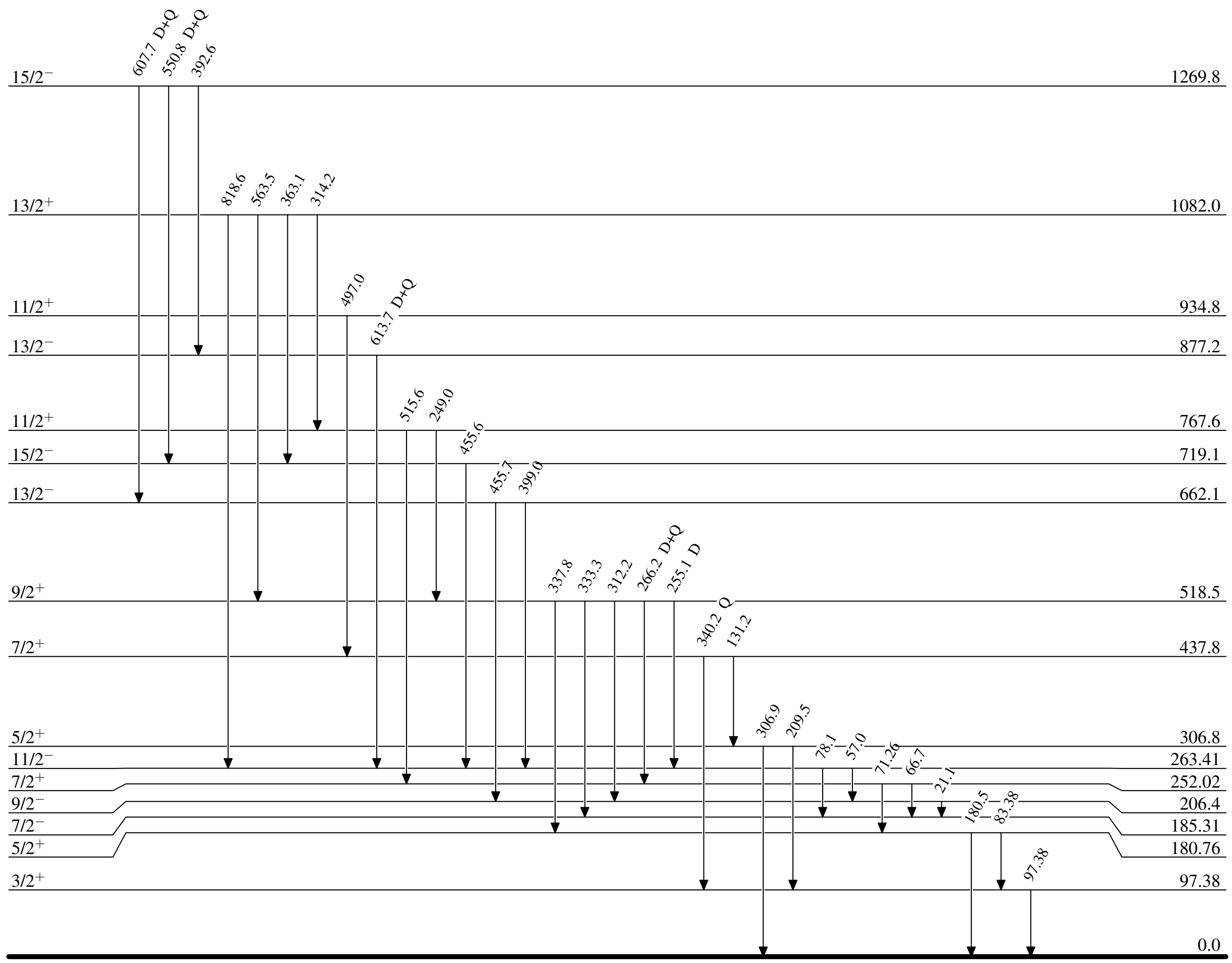
Intensities: Relative I_γ



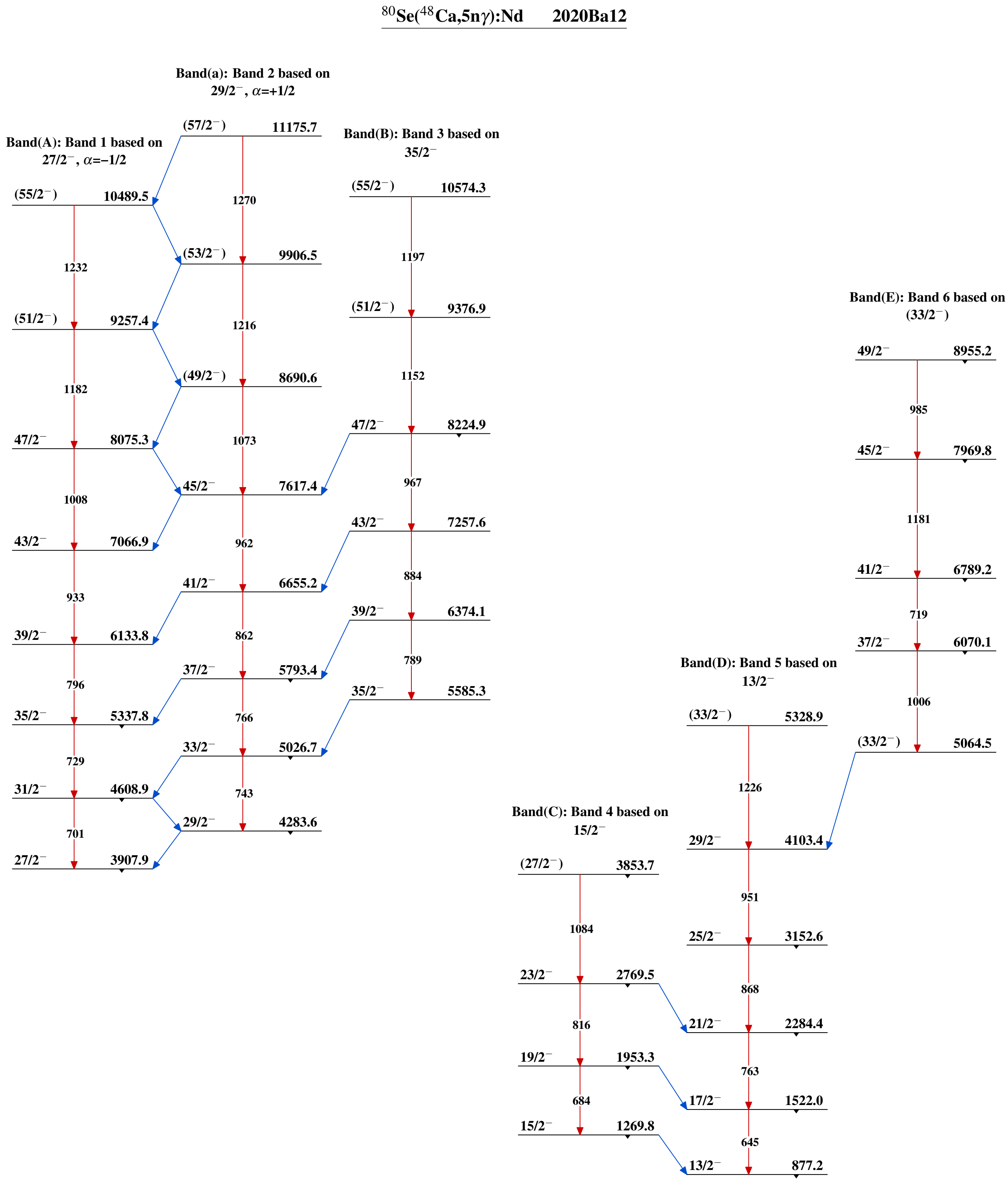
$^{80}Se(^{48}Ca,5n\gamma)$:Nd 2020Ba12

Level Scheme (continued)

Intensities: Relative I_γ

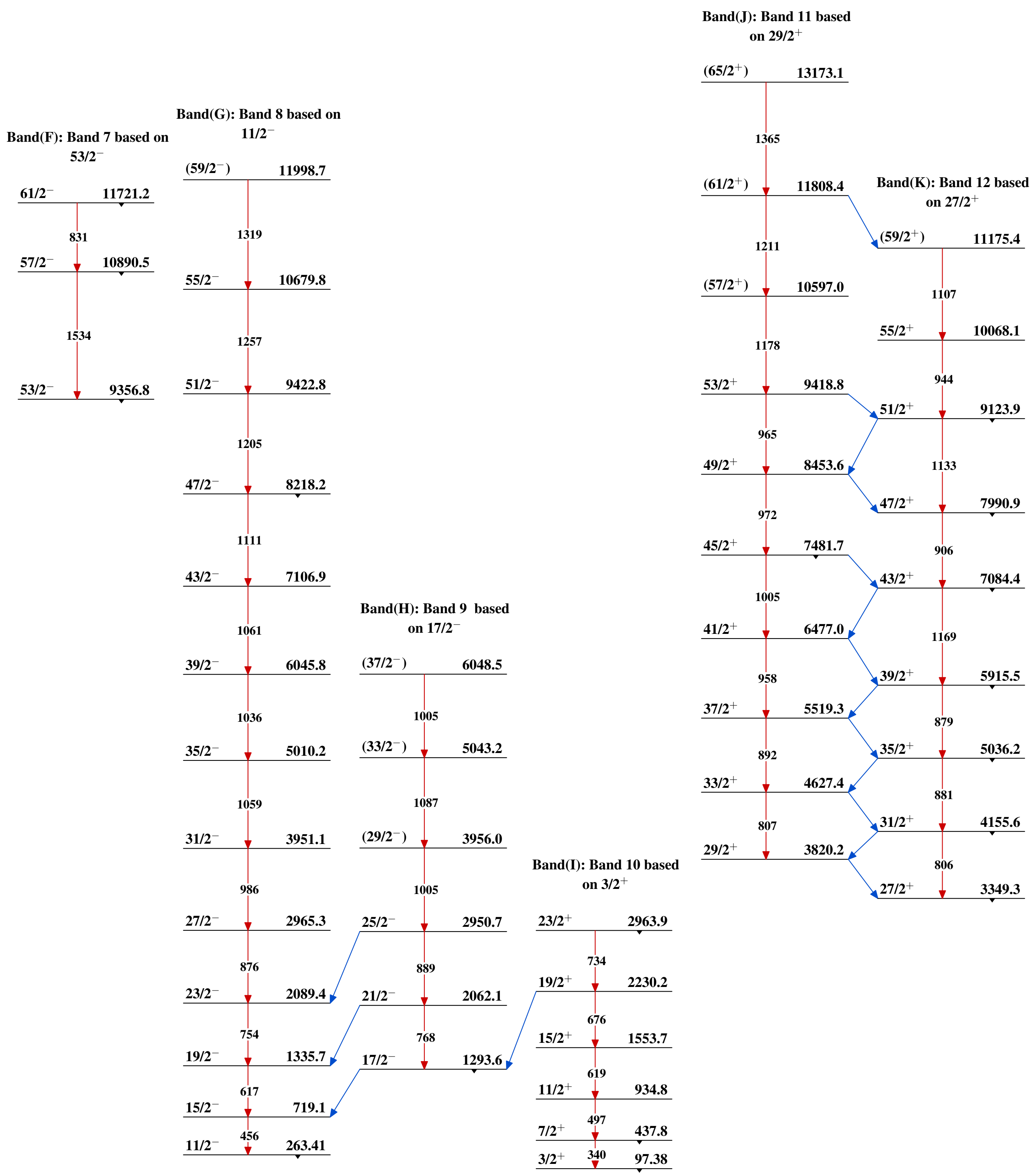


$^{123}_{54}Xe_{69}$


$^{80}Se(^{48}Ca,5n\gamma)$:Nd 2020Ba12
Band(A): Band 1 based on 27/2⁻, α=−1/2
Band(a): Band 2 based on 29/2⁻, α=+1/2
Band(B): Band 3 based on 35/2⁻
Band(C): Band 4 based on 15/2⁻
Band(D): Band 5 based on 13/2⁻
Band(E): Band 6 based on (33/2⁻)
(55/2⁻) 10489.5
(51/2⁻) 9257.4
47/2⁻ 8075.3
43/2⁻ 7066.9
39/2⁻ 6133.8
35/2⁻ 5337.8
31/2⁻ 4608.9
27/2⁻ 3907.9
1232
1182
1008
933
796
729
701
(57/2⁻) 11175.7
(53/2⁻) 9906.5
(49/2⁻) 8690.6
45/2⁻ 7617.4
41/2⁻ 6655.2
37/2⁻ 5793.4
33/2⁻ 5026.7
29/2⁻ 4283.6
1270
1216
1073
962
862
766
743
(55/2⁻) 10574.3
(51/2⁻) 9376.9
47/2⁻ 8224.9
43/2⁻ 7257.6
39/2⁻ 6374.1
35/2⁻ 5585.3
1197
1152
967
884
789
(27/2⁻) 3853.7
23/2⁻ 2769.5
19/2⁻ 1953.3
15/2⁻ 1269.8
1084
816
684
(33/2⁻) 5328.9
29/2⁻ 4103.4
25/2⁻ 3152.6
21/2⁻ 2284.4
17/2⁻ 1522.0
13/2⁻ 877.2
1226
951
868
763
645
49/2⁻ 8955.2
45/2⁻ 7969.8
41/2⁻ 6789.2
37/2⁻ 6070.1
(33/2⁻) 5064.5
985
1181
719
1006

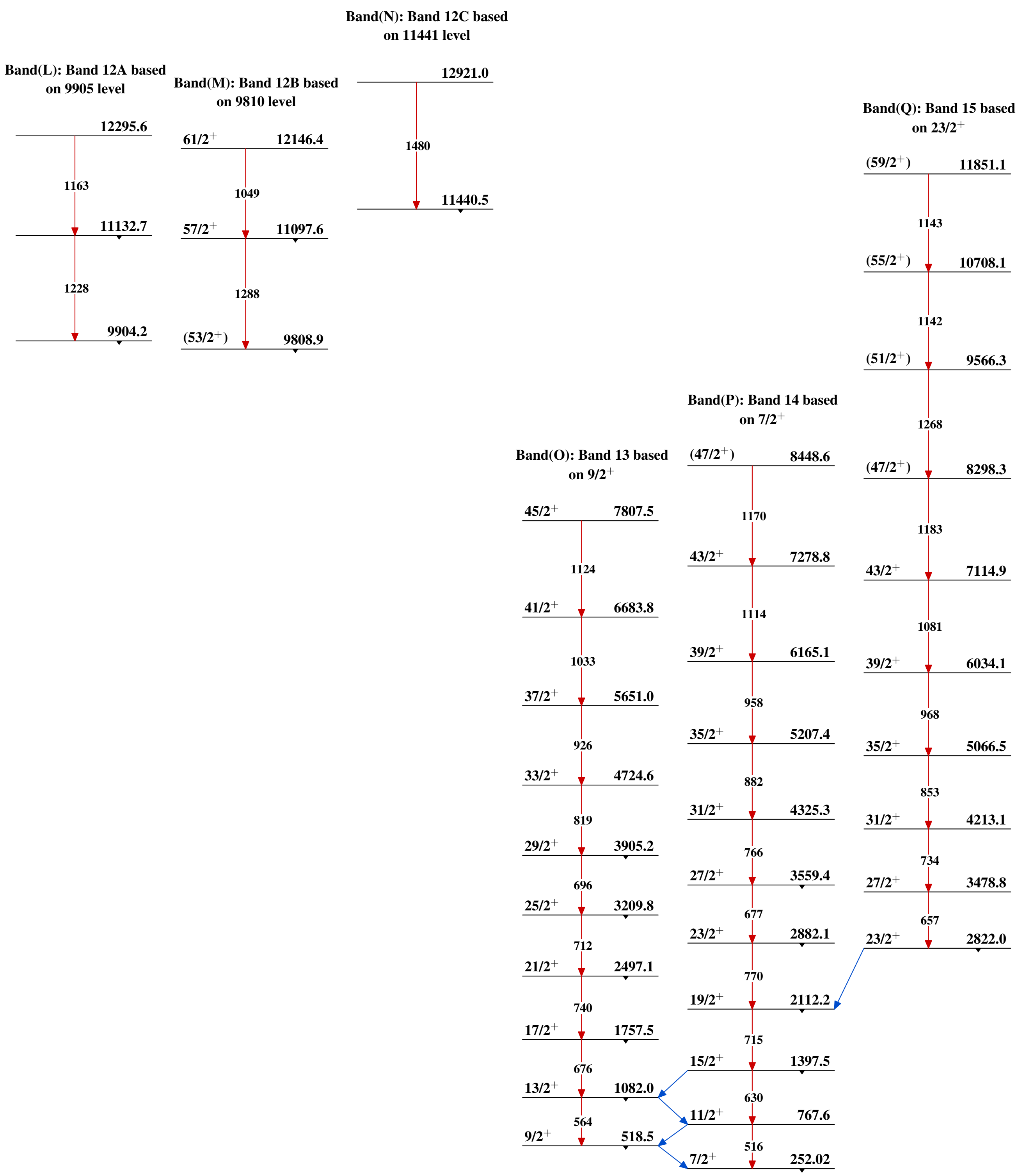
$^{123}_{54}Xe_{69}$

$^{80}Se(^{48}Ca,5n\gamma)$:Nd 2020Ba12 (continued)



$^{123}_{54}Xe_{69}$

$^{80}Se(^{48}Ca,5n\gamma)$:Nd 2020Ba12 (continued)



$^{123}_{54}Xe_{69}$

^{80}Se(^{48}Ca,5nγ):Nd 2020Ba12 (continued)