Adopted Levels, Gammas

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich, Balraj Singh	NDS 111, 1211 (2010)	12-Apr-2010

Q(β^-)=−5.53×10^3 *4*; S(n)=1.003×10^4 *8*; S(p)=2.25×10^3 *4*; Q(α)=3.35×10^3 *4* 2012Wa38
Note: Current evaluation has used the following Q record.
Q(β^-)=−5510 *40*; S(n)=10030 *80*; S(p)=2250 *30*; Q(α)=3350 *40* 2009AuZZ,2003Au03
Additional information 1.
Mass measurement: 2000Ra23.
^{163}Lu has been the object of numerous studies of wobbling excitations in nuclei. For recent theoretical studies and analyses of this phenomenon in ^{163}Lu and related nuclides, see, e.g., 2007Ca08, 2006Al30, 2006Sh25, 2006Sh26, 2005Ha24.

^{163}Lu Levels

Labelling Scheme for the Quasiparticle Orbitals (2004Je03):
A: ν5/2[642], α=+1/2.
B: ν5/2[642], α=−1/2.
C: ν3/2[651], α=+1/2.
D: ν3/2[651], α=−1/2.
E: ν5/2[523], α=+1/2.
F: ν5/2[523], α=−1/2.
G: ν3/2[521], α=+1/2.
H: ν3/2[521], α=−1/2.
a: π1/2[411], α=+1/2.
b: π1/2[411], α=−1/2.
c: π7/2[404], α=+1/2.
d: π7/2[404], α=−1/2.
e: π7/2[523], α=+1/2.
f: π7/2[523], α=−1/2.
g: π9/2[514], α=+1/2.
h: π9/2[514], α=−1/2.
k: π5/2[402], α=+1/2.
l: π5/2[402], α=−1/2.
m: π1/2[660], α=+1/2.
n: π1/2[541], α=+1/2.

Cross Reference (XREF) Flags

A ^{163}Hf ε decay (40.0 s)
B ^{139}La(^{28}Si,4nγ)
C ^{139}La(^{29}Si,5nγ)

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	XREF	Comments
0.0[f]	1/2$^{(+)}$	3.97 min *13*	ABC	%ε+%β^+=100 μ=+0.0769 *10* (1998Ge13,2005St24) Δ<r^2>(^{170}Lu−^{163}Lu)=−0.835 fm^2 (Laser spectroscopy, 1998Ge13). from an evaluation of nuclear rms charge radii, 2004An14 report <r^2>$^{1/2}$=5.258 fm *9*. μ: collinear fast beam laser spectroscopy (1998Ge13). J$^\pi$: spin from LASER hyperfine spectroscopy (1998Ge13). Parity from probable π1/2[411] bandhead. T$_{1/2}$: from 1983Ge08. Others: 4.1 min *2* (1980Be39), <3 min (1975Ad09).
16.84[g] *22*	(3/2$^+$)		ABC	

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Adopted Levels, Gammas (continued)

^{163}Lu Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
62.22[q] *23*	(5/2+)		ABC	Jπ: M1 γ to 1/2(+).
124.36[e] *24*	(7/2+)		ABC	
190.87[f] *20*	(5/2+)		BC	
195.31[c] *24*	(7/2−)		ABC	
210.1[b] *4*	(9/2−)		BC	
224.5[r] *3*	(7/2+)		ABC	
250.09[g] *23*	(7/2+)		ABC	
280.2? *3*			A	
295.5[c] *4*	(11/2−)		BC	
310.5[d] *3*	(9/2+)		BC	
414.2[q] *5*	(9/2+)		C	
492.1[b] *4*	(13/2−)		BC	
520.5[e] *3*	(11/2+)		BC	
520.85[f] *22*	(9/2+)		BC	
620.94[g] *24*	(11/2+)		BC	
642.2[r] *7*	(11/2+)		C	
644.7[c] *4*	(15/2−)	5.6[@] ps *+6−11*	BC	
691.4 *3*			A	
715.6 *3*			A	
730.6 *4*			A	
754.8[d] *3*	(13/2+)		BC	
875.2[q] *7*	(13/2+)		C	
883.6 *3*			A	
937.4[b] *4*	(17/2−)	1.4[@] ps *+8−7*	BC	
967.86[f] *24*	(13/2+)		BC	
1008.2[e] *3*	(15/2+)		BC	
1106.91[g] *25*	(15/2+)		BC	
1115.4[c] *4*	(19/2−)	1.9[@] ps *+2−4*	BC	
1152.4[r] *8*	(15/2+)		C	
1282.5[d] *3*	(17/2+)		BC	
1286.0? *10*	(13/2+)		C	
1417.0[q] *7*	(17/2+)		C	
1485.8[b] *4*	(21/2−)	0.9[@] ps *3*	BC	
1501.71[f] *25*	(17/2+)		BC	
1562.1[e] *3*	(19/2+)		BC	
1669.9[g] *3*	(19/2+)		BC	
1677.4[c] *4*	(23/2−)	1.0[@] ps *+2−3*	BC	
1730.1[r] *7*	(19/2+)		C	
1739.9[t] *10*	(13/2+)		BC	
1867.7[d] *3*	(21/2+)		BC	
1936.5[t] *8*	(17/2+)		BC	
2009.0 *6*	(21/2+)		C	
2020.6[q] *7*	(21/2+)		C	
2087.6[f] *3*	(21/2+)		C	
2104.4[b] *4*	(25/2−)		BC	
2139.8[e] *3*	(23/2+)		BC	
2199.6[t] *4*	(21/2+)		BC	
2228.4 *6*	(23/2+)		C	

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Adopted Levels, Gammas (continued)

^{163}Lu Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	XREF
2276.7[g] *3*	(23/2$^+$)		BC
2307.6[c] *4*	(27/2$^-$)	1.2[@] ps *+3–5*	BC
2339.7[r] *10*	(23/2$^+$)		C
2400.5[d] *3*	(25/2$^+$)		BC
2410.8[j] *9*	(21/2$^+$)		C
2437.1[k] *4*	(23/2$^+$)		C
2488.6 *7*	(25/2$^+$)		C
2514.5[t] *4*	(25/2$^+$)	3.3[&] ps *+7–5*	BC
2540.8[j] *4*	(25/2$^+$)		C
2614.6[e] *3*	(27/2$^+$)		BC
2681.1[k] *4*	(27/2$^+$)		C
2685.7 *6*	(27/2$^+$)		C
2748.3[b] *4*	(29/2$^-$)		BC
2773.5[g] *4*	(27/2$^+$)		C
2803.7[d] *3*	(29/2$^+$)		BC
2855.4[h] *7*	(29/2$^-$)		BC
2861.2[j] *4*	(29/2$^+$)		C
2900.8[t] *4*	(29/2$^+$)	2.3[&] ps *+5–4*	BC
2925.0[c] *4*	(31/2$^-$)		BC
3004.1[e] *3*	(31/2$^+$)		BC
3021.5[i] *6*	(31/2$^-$)		BC
3078.4[k] *4*	(31/2$^+$)		C
3079.3[u] *9*	(27/2$^+$)		C
3123.4[b] *4*	(33/2$^-$)		BC
3130.7[g] *7*	(31/2$^+$)		C
3245.2[d] *3*	(33/2$^+$)		BC
3320.8[c] *4*	(35/2$^-$)	4.2[@] ps *+5–6*	BC
3323.9[j] *4*	(33/2$^+$)		C
3351.1[t] *4*	(33/2$^+$)	0.9[&] ps *+5–3*	BC
3418.8[h] *7*	(33/2$^-$)		C
3483.8[e] *3*	(35/2$^+$)		BC
3486.6[u] *7*	(31/2$^+$)		C
3551.9[b] *4*	(37/2$^-$)		BC
3572.1[k] *4*	(35/2$^+$)		C
3635.8[m] *7*	(35/2$^+$)		C
3667.8[i] *7*	(35/2$^-$)		C
3789.9[d] *3*	(37/2$^+$)		BC
3822.7[c] *4*	(39/2$^-$)		BC
3863.6[v] *8*	(33/2$^+$)		C
3866.4[t] *5*	(37/2$^+$)	0.31[&] ps *+14–11*	BC
3892.6[j] *7*	(37/2$^+$)		C
3958.3[u] *7*	(35/2$^+$)		C
3996.0[h] *8*	(37/2$^-$)		C
4068.3[e] *4*	(39/2$^+$)		BC
4103.9[b] *4*	(41/2$^-$)		BC
4150.8[k] *4*	(39/2$^+$)		C
4253.8[i] *8*	(39/2$^-$)		C

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Adopted Levels, Gammas (continued)

^{163}Lu Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	XREF	Comments
4255.6[m] 7	(39/2$^+$)		C	
4309.3[o] 7	(37/2$^-$)		C	
4369.2[v] 7	(37/2$^+$)		C	
4405.9[d] 4	(41/2$^+$)		BC	
4431.4[c] 4	(43/2$^-$)		BC	
4445.0[t] 5	(41/2$^+$)	0.25[a] ps *+5−7*	BC	T$_{1/2}$: other: 0.15 ps *+6−5* (1993Sc13,1992ScZL). Q$_t$=9.9 *+11−10* (2004Go14).
4492.6[u] 7	(39/2$^+$)		C	
4529.5[j] 8	(41/2$^+$)		C	
4556.6[h] 7	(41/2$^-$)		C	
4579.0[p] 7	(39/2$^-$)		C	
4719.7[e] 4	(43/2$^+$)		BC	
4760.7[b] 5	(45/2$^-$)		BC	
4817.3[k] 5	(43/2$^+$)		C	
4831.2[o] 7	(41/2$^-$)		C	
4849.0[i] 7	(43/2$^-$)		C	
4904.1[m] 7	(43/2$^+$)		C	
4937.2[v] 7	(41/2$^+$)		C	
5057.5[d] 4	(45/2$^+$)		BC	
5084.0[t] 5	(45/2$^+$)	173[a] fs *+24−27*	BC	T$_{1/2}$: other: 0.10 ps *+4−3* (1993Sc13,1992ScZL). Q$_t$=9.3 *+7−6* (2004Go14).
5088.3[u] 7	(43/2$^+$)		C	
5116.1[p] 7	(43/2$^-$)		C	
5131.8[c] 5	(47/2$^-$)	0.15[@] ps *5*	BC	
5168.8[h] 7	(45/2$^-$)		C	
5209.6[l] 7	(45/2$^+$)		C	
5243.4[j] 10	(45/2$^+$)		C	
5387.9[e] 4	(47/2$^+$)		BC	
5419.5[o] 7	(45/2$^-$)		C	
5496.2[i] 8	(47/2$^-$)		C	
5505.1[b] 5	(49/2$^-$)	0.11[@] ps *+5−3*	BC	
5557.4[m] 7	(47/2$^+$)		C	
5559.5[k] 5	(47/2$^+$)		C	
5564.2[v] 5	(45/2$^+$)		C	
5720.1[d] 4	(49/2$^+$)		BC	
5742.9[u] 8	(47/2$^+$)	149[a] fs *+26−33*	C	Q$_t$=8.5 *+10−7* (2004Go14).
5757.0[p] 8	(47/2$^-$)		C	
5781.0[t] 5	(49/2$^+$)	140[a] fs *+15−16*	BC	T$_{1/2}$: other: 0.08 ps *+4−3* (1993Sc13,1992ScZL). Q$_t$=8.3 *+5−4* (2004Go14).
5853.1[h] 8	(49/2$^-$)		C	
5898.2[l] 8	(49/2$^+$)		C	
5916.9[c] 5	(51/2$^-$)	0.12[@] ps *+3−6*	BC	
6006.1[j] 8	(49/2$^+$)		C	
6065.3[e] 4	(51/2$^+$)		BC	
6108.2[o] 9	(49/2$^-$)		C	
6223.5[i] 10	(51/2$^-$)		C	
6246.5[m] 8	(51/2$^+$)		C	
6249.3[v] 8	(49/2$^+$)		C	

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Adopted Levels, Gammas (continued)

^{163}Lu Levels (continued)

E(level)[†]	Jπ[‡]	T$_{1/2}$[#]	XREF	Comments
6319.9[w] *9*	(47/2$^-$)		C	
6334.1[b] *5*	(53/2$^-$)	0.09[@] ps *+6–4*	BC	
6355.9[k] *10*	(51/2$^+$)		C	
6415.1[d] *4*	(53/2$^+$)		BC	
6454.2[u] *8*	(51/2$^+$)	100[a] fs *+12–15*	C	Q$_t$=8.7 *+7–5* (2004Go14).
6502.7[p] *10*	(51/2$^-$)		C	
6533.6[t] *5*	(53/2$^+$)	82[a] fs *+6–7*	BC	T$_{1/2}$: others: 55 fs *+21–28* (1993Sc13,1992ScZL), 0.10 ps (2002Sc11). Q$_t$=8.9 *4* (2004Go14).
6616.5[l] *10*	(53/2$^+$)		C	
6618.0[h] *10*	(53/2$^-$)		C	
6719.1[j] *10*	(53/2$^+$)		C	
6788.9[e] *4*	(55/2$^+$)		BC	
6790.0[c] *8*	(55/2$^-$)		BC	
6907.4[o] *11*	(53/2$^-$)		C	
6965.0[w] *9*	(51/2$^-$)		C	
6980.1[m] *11*	(55/2$^+$)		C	
6990.5[v] *8*	(53/2$^+$)		C	
7035.4[i] *11*	(55/2$^-$)		C	
7133.1[k] *11*	(55/2$^+$)		C	
7174.2[d] *4*	(57/2$^+$)		BC	
7179.1[s] *10*	(55/2$^+$)		C	
7220.4[u] *9*	(55/2$^+$)	66[a] fs *+9–12*	C	Q$_t$=8.9 *+8–6* (2004Go14).
7246.9[b] *9*	(57/2$^-$)		BC	
7339.1[t] *5*	(57/2$^+$)	66[a] fs *8*	BC	T$_{1/2}$: others: 0.04 ps *3* (1993Sc13,1992ScZL), 67 fs (2002Sc11). Q$_t$=8.4 *5* (2004Go14).
7351.2[p] *12*	(55/2$^-$)		C	
7391.0[l] *12*	(57/2$^+$)		C	
7466.8[h] *12*	(57/2$^-$)		C	
7507.0[j] *12*	(57/2$^+$)		C	
7584.4[e] *4*	(59/2$^+$)		BC	
7667.2[w] *9*	(55/2$^-$)		C	
7729.3[c] *10*	(59/2$^-$)		BC	
7785.3[m] *12*	(59/2$^+$)		C	
7786.4[v] *9*	(57/2$^+$)		C	
7813.9[o] *13*	(57/2$^-$)		C	
7903.4[i] *13*	(59/2$^-$)		C	
7955.9[k] *13*	(59/2$^+$)		C	
8011.1[d] *4*	(61/2$^+$)		BC	
8040.3[u] *9*	(59/2$^+$)	60[a] fs *+18–26*	C	Q$_t$=7.8 *+17–12* (2004Go14).
8046.1[s] *10*	(59/2$^+$)		C	
8196.9[t] *10*	(61/2$^+$)	61[a] fs *+7–8*	BC	T$_{1/2}$: others: 53 fs (2002Sc11), 34 fs *+35–33* (1992ScZL).
8222.8[b] *11*	(61/2$^-$)		BC	
8237.3[l] *13*	(61/2$^+$)		C	
8291.2[p] *14*	(59/2$^-$)		C	
8379.8[h] *16*	(61/2$^-$)		C	
8387.2[j] *16*	(61/2$^+$)		C	
8421.8[w] *10*	(59/2$^-$)		C	
8459.4[e] *8*	(63/2$^+$)		BC	

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Adopted Levels, Gammas (continued)

^{163}Lu Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	XREF	Comments
8636.2[v] 9	(61/2$^+$)		C	
8668.7[m] 14	(63/2$^+$)		C	
8713.6[c] 12	(63/2$^-$)		C	
8790.3[o] 15	(61/2$^-$)		C	
8845.6[i] 17	(63/2$^-$)		C	
8855.7[k] 17	(63/2$^+$)		C	
8913.2[u] 11	(63/2$^+$)	44[a] fs +9−15	C	Q$_t$=7.9 +13−8 (2004Go14).
8927.0[d] 9	(65/2$^+$)		BC	
8974.2[s] 14	(63/2$^+$)		C	
9106.6[t] 14	(65/2$^+$)	46[a] fs +7−10	BC	Q$_t$=7.4 +8−6 (2004Go14).
9154.2[l] 15	(65/2$^+$)		C	
9231.8[w] 14	(63/2$^-$)		C	
9252.8[b] 13	(65/2$^-$)		C	
9284.6[p] 17	(63/2$^-$)		C	
9331.0[j] 19	(65/2$^+$)		C	
9376.3[h] 19	(65/2$^-$)		C	
9408.7[e] 10	(67/2$^+$)		BC	
9538.7[v] 14	(65/2$^+$)		C	
9625.5[m] 15	(67/2$^+$)		C	
9709.0[c] 14	(67/2$^-$)		C	
9805.3[o] 18	(65/2$^-$)		C	
9816.2[k] 20	(67/2$^+$)		C	
9839.7[u] 15	(67/2$^+$)	52[a] fs +12−17	C	Q$_t$=6.7 +11−8 (2004Go14).
9916.8[d] 11	(69/2$^+$)		BC	
10069.2[t] 14	(69/2$^+$)	33[a] fs +12−8	BC	Q$_t$=7.6 +15−9 (2004Go14).
10097.2[w] 17	(67/2$^-$)		C	
10138.5[l] 16	(69/2$^+$)		C	
10314.7[b] 16	(69/2$^-$)		C	
10333.9[j] 21	(69/2$^+$)		C	
10428.3[e] 12	(71/2$^+$)		BC	
10494.5[v] 17	(69/2$^+$)		C	
10653.5[m] 17	(71/2$^+$)		C	
10714.9[c] 17	(71/2$^-$)		C	
10819.9[u] 18	(71/2$^+$)	39[a] fs +12−20	C	Q$_t$=6.7 +17−10 (2004Go14).
10876.3[o] 21	(69/2$^-$)		C	
10978.4[d] 13	(73/2$^+$)		BC	
11017.7[w] 20	(71/2$^-$)		C	
11085.7[t] 18	(73/2$^+$)		C	
11186.8[l] 19	(73/2$^+$)		C	
11503.7[v] 20	(73/2$^+$)		C	
11505.4[e] 14	(75/2$^+$)		BC	
11729.9[n] 20	(75/2$^-$)		C	
11749.0[m] 20	(75/2$^+$)		C	
11781.4[c] 20	(75/2$^-$)		C	
11854.6[u] 21	(75/2$^+$)		C	
11993.4[w] 22	(75/2$^-$)		C	
12098.1[d] 16	(77/2$^+$)		BC	
12156.8[t] 20	(77/2$^+$)		C	

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Adopted Levels, Gammas (continued)

^{163}Lu Levels (continued)

E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF
12266.9[l] *21*	(77/2$^+$)	C	13283.0[t] *23*	(81/2$^+$)	C	15284[u] *3*	(87/2$^+$)	C
12566.7[v] *22*	(77/2$^+$)	C	13679.1[v] *25*	(81/2$^+$)	C	15689[t] *3*	(89/2$^+$)	C
12627.2[e] *17*	(79/2$^+$)	BC	13746.8[e] *20*	(83/2$^+$)	C	16024[n] *4*	(91/2$^-$)	C
12745[n] *3*	(79/2$^-$)	C	13798[n] *3*	(83/2$^-$)	C	16531[u] *3*	(91/2$^+$)	C
12862.4[m] *22*	(79/2$^+$)	C	14086.5[u] *25*	(83/2$^+$)	C	16958[t] *3*	(93/2$^+$)	C
12866.0[c] *22*	(79/2$^-$)	C	14110?[w] *3*	(83/2$^-$)	C	17204[n] *4*	(95/2$^-$)	C
12943.5[u] *23*	(79/2$^+$)	C	14462.3[t] *25*	(85/2$^+$)	C	18262[t] *3*	(97/2$^+$)	C
13025.0[w] *25*	(79/2$^-$)	C	14826[v] *5*	(85/2$^+$)	C	18436[n] *4*	(99/2$^-$)	C
13198.3?[d] *19*	(81/2$^+$)	C	14890[n] *4*	(87/2$^-$)	C			

† From least-squares fit to Eγ′s, assuming Δ(Eγ)=0.3 keV for each γ ray, except for uncertain γ rays, for which 1 keV is assumed.

‡ The assignments are as proposed by 2002Je05, 1999Do34 and 1992Sc03 in (HI,xnγ) which are based on γγ(θ) (DCO) data and associated band structures. The parentheses are added by the evaluators on account of lack of firm evidence for Jπ′s of low-lying levels and bandheads. It is assumed that multipolarities are M1(+E2) for ΔJ=1 and E2 for ΔJ=2 transitions.

For excited states, values are from DSAM or RDDS (1992ScZL,1993Sc13,2002Sc11 and 2004Go14) in (HI,xnγ) studies.

@ From RDDS (1992ScZL).

& From RDDS (1993Sc13,1992ScZL).

[a] From DSAM (2004Go14).

[b] Band(A): π7/2[523], α=+1/2. Strongly-coupled band (1993Sc13,1999Do34,2002Je05,2004Je03). Of the two possible choices (1992Sc03), π7/2[523] and π9/2[514], π7/2[523] is preferred (1993Sc13,1999Do34), based on the experimental Q_t pattern with K=7/2 or 9/2 and a comparison of experimental and calculated B(M1) values. AB crossing at ħω≈0.26 MeV.

[c] Band(a): π7/2[523], α=−1/2. Strongly-coupled band (1993Sc13,1999Do34,2002Je05,2004Je03). See the comment for the signature=+1/2 partner of this band. AB crossing at ħω≈0.26 MeV.

[d] Band(B): π7/2[404], α=+1/2. Strongly-coupled band (1992Sc03,1999Do34,2002Je05,2004Je03). AB crossing at ħω≈0.26 MeV; changes to (π7/2[523])⊗AEBC after AB crossing.

[e] Band(b): π7/2[404], α=−1/2. Strongly-coupled band (1992Sc03,1999Do34,2002Je05,2004Je03). AB crossing at ħω≈0.26 MeV; changes to (π7/2[523])⊗AEBC after AB crossing.

[f] Band(C): π1/2[411], α=+1/2. (1999Do34,2002Je05,2004Je03).

[g] Band(c): π1/2[411], α=−1/2. (1999Do34,2002Je05,2004Je03).

[h] Band(D): Band based on (29/2$^-$), α=+1/2. Possible continuation of the π7/2[523] band into (π7/2[523])⊗BC. EF and AD could also be involved at higher spins.

[i] Band(d): Band based on (31/2$^-$), α=−1/2. Possible continuation of the π7/2[523] band into (π7/2[523])⊗BC. EF and AD could also be involved at higher spins.

[j] Band(E): (π7/2[404])⊗AB at low spins, α=+1/2. (π9/2[514])⊗AEBC at high spins.

[k] Band(e): (π7/2[404])⊗AB at low spins, α=−1/2. (π9/2[514])⊗AEBC at high spins.

[l] Band(F): (π7/2[523])⊗AHBC, α=+1/2.

[m] Band(f): (π7/2[523])⊗AHBC, α=−1/2.

[n] Band(G): (π1/2[660])⊗AEBC, α=−1/2.

[o] Band(H): (π9/2[514])⊗AB, α=+1/2.

[p] Band(h): (π9/2[514])⊗AB, α=−1/2.

[q] Band(I): π5/2[402], α=+1/2. (2002Je05,2004Je03).

[r] Band(i): π5/2[402], α=−1/2. (2002Je05,2004Je03).

[s] Band(J): Band based on 55/2$^+$, α=−1/2.

[t] Band(K): Triaxial SD-1 band. (2004Je03,2004Go14,2002Je05,2002Sc11,2001Od03,1999Do34,1995Sc39). Q_t varies from 9.9 to 7.6 (2004Go14) from the 41/2 to the 69/2 levels. Others: Q_t over the entire band: 8.2 *+10−6* (2002Sc11); 7.4 *+7−4* or 7.7 *+23−13* (2002Sc47); 10.7 *7* (1993Sc13). Possible configuration=π$i_{13/2}$, 1/2[660], α=+1/2; β_2≈0.42 (1993Sc13,1992Sc03). Percent population (relative to normal-deformed yrast band)≈10 (2004Je03,1999Do34), 14 (2002Je05).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{163}Lu Levels (continued)

[u] Band(L): One-phonon wobbling-mode. Triaxial SD-2 band (2004Je03,2004Go14,2002Je05,2001Od03,1999Do34). One-phonon wobbling mode excitation built on yrast $\pi i_{13/2}$ triaxial SD-1 band. Q_t varies from 8.5 to 6.7 (2004Go14) from the 47/2 to the 71/2 levels. Percent population (relative to normal-deformed yrast band)≈3 (2004Je03), ≈2.0 (2002Je05), ≈2.5 (1999Do34).

[v] Band(M): Two-phonon wobbling-mode. Triaxial SD-3 band, α=+1/2 (2004Je03,2002Je05). Two-phonon wobbling mode excitation built on yrast triaxial SD-1 band. Percent population (relative to normal-deformed yrast band)≈1.2 (2004Je03), ≈0.7 (2002Je05).

[w] Band(N): Triaxial SD-4 band. α=−1/2 (2004Je03,2002Je05). Possibly negative-parity yrast band. This band cannot be interpreted as a wobbling phonon excitation since its nature is different from SD-1 to SD-3 bands. Probable configuration= $\pi i_{13/2}\otimes(\nu i_{13/2},\alpha=-1/2)\otimes(\nu h_{9/2},\alpha=-1/2)$ Percent population (relative to normal-deformed yrast band)≈0.9 (2004Je03), ≈0.35 (2002Je05).

Adopted Levels, Gammas (continued)

γ(^{163}Lu)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[c]	Comments
62.22	(5/2$^+$)	45.39[§] *8*	100[§]	16.84	(3/2$^+$)	M1[§]		6.12	
124.36	(7/2$^+$)	62.14[§] *5*	100[§]	62.22	(5/2$^+$)	M1[§]		2.43	
190.87	(5/2$^+$)	173.87 *10*	42 *9*	16.84	(3/2$^+$)	D[#]			
		190.90 *20*	100 *7*	0.0	1/2$^{(+)}$				
195.31	(7/2$^-$)	70.98[§] *8*	100[§]	124.36	(7/2$^+$)	E1[§]		0.849	
		133.08[§] *10*	24[§] *1*	62.22	(5/2$^+$)	*b*			
210.1	(9/2$^-$)	85.9 *10*	100	124.36	(7/2$^+$)				
224.5	(7/2$^+$)	162.25 *15*	100	62.22	(5/2$^+$)				E_γ: from ^{163}Hf ε decay.
250.09	(7/2$^+$)	188.2 *10*	47 *10*	62.22	(5/2$^+$)	D[#]			
		233.35 *10*	100 *10*	16.84	(3/2$^+$)	(Q)[@]			E_γ: from ^{163}Hf ε decay.
280.2?		84.9 *1*		195.31	(7/2$^-$)				
295.5	(11/2$^-$)	85.4 *10*	100	210.1	(9/2$^-$)				
310.5	(9/2$^+$)	186.15 *10*	100 *14*	124.36	(7/2$^+$)				
		247.6[d] *5*	5.4 *22*	62.22	(5/2$^+$)				
414.2	(9/2$^+$)	189.8 *10*	100 *35*	224.5	(7/2$^+$)				
		352.0 *10*	52 *14*	62.22	(5/2$^+$)				
492.1	(13/2$^-$)	196.6 *10*	100 *8*	295.5	(11/2$^-$)	(D)[#]			δ(Q/D)=+0.03 *2*.
		282.00 *10*	39 *5*	210.1	(9/2$^-$)	(Q)[@]			
520.5	(11/2$^+$)	106.2 *10*	16.5 *17*	414.2	(9/2$^+$)				
		210.0 *10*	58 *6*	310.5	(9/2$^+$)				
		296.1 *5*	4.4 *14*	224.5	(7/2$^+$)				
		396.5 *10*	100 *9*	124.36	(7/2$^+$)	(Q)[a]			
520.85	(9/2$^+$)	270.87 *17*	69 *11*	250.09	(7/2$^+$)	D[#]			
		296.5[d] *5*	22 *4*	224.5	(7/2$^+$)				
		329.85 *10*	100 *14*	190.87	(5/2$^+$)	(Q)[@]			
620.94	(11/2$^+$)	207.0 *10*	4.4 *32*	414.2	(9/2$^+$)				
		370.93 *9*	100 *14*	250.09	(7/2$^+$)	(Q)[@]			
		396.3[d] *5*	65 *10*	224.5	(7/2$^+$)				
642.2	(11/2$^+$)	228.0 *10*	67 *16*	414.2	(9/2$^+$)				
		417.8 *10*	100 *13*	224.5	(7/2$^+$)				
644.7	(15/2$^-$)	152.7 *10*	56 *4*	492.1	(13/2$^-$)	(M1+E2)[#]	+0.22 *1*	1.08 *3*	B(M1)(W.u.)=(0.27 *+6–4*); B(E2)(W.u.)=(2.7 *+7–5*)
		349.21 *10*	100 *3*	295.5	(11/2$^-$)	E2[@]		0.0490	B(E2)(W.u.)=166 *+34–16*
691.4		496.07 *10*	100	195.31	(7/2$^-$)				
715.6		520.32 *10*	100	195.31	(7/2$^-$)				
730.6		535.25 *20*	100	195.31	(7/2$^-$)				
754.8	(13/2$^+$)	234.3 *10*	37 *3*	520.5	(11/2$^+$)				
		444.35 *10*	100 *7*	310.5	(9/2$^+$)				
875.2	(13/2$^+$)	233.0 *10*	91 *15*	642.2	(11/2$^+$)				

From ENSDF

$^{163}_{71}Lu_{92}$-9

Adopted Levels, Gammas (continued)

γ(^{163}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[c]	Comments
875.2	(13/2$^+$)	461.0 *10*	100 *20*	414.2	(9/2$^+$)				
883.6		688.25 *10*	100	195.31	(7/2$^-$)				
937.4	(17/2$^-$)	292.64 *10*	100 *7*	644.7	(15/2$^-$)	(M1+E2)[#]	+0.03 *1*	0.183	B(M1)(W.u.)=(0.31 *+16−18*); B(E2)(W.u.)=(1.6 *6*)
		445.30 *10*	83 *5*	492.1	(13/2$^-$)	E2[a]		0.0251	B(E2)(W.u.)=1.8×10^2 *+9−11*
967.86	(13/2$^+$)	347.08 *17*	32 *7*	620.94	(11/2$^+$)	D			
		446.91 *10*	100 *11*	520.85	(9/2$^+$)	(Q)[@]			
1008.2	(15/2$^+$)	253.37 *10*	26.8 *22*	754.8	(13/2$^+$)				
		487.69 *10*	100 *8*	520.5	(11/2$^+$)				
1106.91	(15/2$^+$)	486.00 *10*	100	620.94	(11/2$^+$)	(Q)[@]			
1115.4	(19/2$^-$)	177.97 *10*	24 *3*	937.4	(17/2$^-$)	(M1+E2)[#]	+0.15 *2*	0.710 *11*	B(M1)(W.u.)=(0.34 *+9−6*); B(E2)(W.u.)=(1.2×10^2 *+5−4*)
		470.63 *10*	100 *8*	644.7	(15/2$^-$)	E2[@]		0.0217	B(E2)(W.u.)=1.7×10^2 *+4−3*
1152.4	(15/2$^+$)	277.2 *10*	92 *17*	875.2	(13/2$^+$)				
		510.2 *10*	100 *17*	642.2	(11/2$^+$)				
1282.5	(17/2$^+$)	274.31 *10*	24.2 *25*	1008.2	(15/2$^+$)				
		527.77 *10*	100 *10*	754.8	(13/2$^+$)				
1286.0?	(13/2$^+$)	990.6[d] *10*	100	295.5	(11/2$^-$)				
1417.0	(17/2$^+$)	264.6 *10*	27 *10*	1152.4	(15/2$^+$)				
		541.8 *10*	100 *15*	875.2	(13/2$^+$)				
1485.8	(21/2$^-$)	370.50 *10*	84 *8*	1115.4	(19/2$^-$)	(M1+E2)[#]	+0.05 *3*	0.0972	B(M1)(W.u.)=(0.21 *8*); B(E2)(W.u.)=(1.8 *+23−18*)
		548.49 *10*	100 *7*	937.4	(17/2$^-$)	(E2)[a]		0.0147 *6*	B(E2)(W.u.)=1.2×10^2 *5*
1501.71	(17/2$^+$)	394.90 *16*	54 *8*	1106.91	(15/2$^+$)				Iγ(395)/Iγ(534)=0.11 *2* (1999Do34) is in disagreement.
		533.81 *10*	100 *13*	967.86	(13/2$^+$)	(Q)[@]			
1562.1	(19/2$^+$)	279.58 *10*	25.9 *22*	1282.5	(17/2$^+$)				Iγ(280)/Iγ(554)=0.13 *3* (1992Sc03) is in disagreement.
		553.85 *10*	100 *7*	1008.2	(15/2$^+$)				
1669.9	(19/2$^+$)	562.96 *10*	100	1106.91	(15/2$^+$)				
1677.4	(23/2$^-$)	191.54 *10*	13.7 *12*	1485.8	(21/2$^-$)	(M1+E2)[#]	+0.18 *9*	0.576 *13*	B(M1)(W.u.)=(0.338 *11*); B(E2)(W.u.)=(1.5×10^2 *14*)
		562.00 *10*	100 *7*	1115.4	(19/2$^-$)	E2[@]		0.0139 *1*	B(E2)(W.u.)=1.6×10^2 *+5−4*
1730.1	(19/2$^+$)	313.1 *10*	44 *33*	1417.0	(17/2$^+$)				
		577.7 *10*	100 *56*	1152.4	(15/2$^+$)				
1739.9	(13/2$^+$)	453.9[d] *10*	100	1286.0?	(13/2$^+$)				
1867.7	(21/2$^+$)	305.65 *10*	26 *4*	1562.1	(19/2$^+$)				
		585.17 *10*	100 *9*	1282.5	(17/2$^+$)				
1936.5	(17/2$^+$)	196.7 *10*	100 *56*	1739.9	(13/2$^+$)	(Q)			
		1292.0 *10*	6 *4*	644.7	(15/2$^-$)				
2009.0	(21/2$^+$)	592.0 *10*	100 *29*	1417.0	(17/2$^+$)				
		893.7 *10*	43 *29*	1115.4	(19/2$^-$)				
2020.6	(21/2$^+$)	290.5[d] *10*	8 *7*	1730.1	(19/2$^+$)				
		603.5 *10*	100 *17*	1417.0	(17/2$^+$)				
2087.6	(21/2$^+$)	585.86 *17*	100	1501.71	(17/2$^+$)	[@]			

From ENSDF

$^{163}_{71}Lu_{92}$-10

Adopted Levels, Gammas (continued)

γ(^{163}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[c]	Comments
2104.4	(25/2⁻)	426.95 *10*	97 *7*	1677.4	(23/2⁻)	(D)[a]			δ(Q/D)=+0.07 *5*.
		618.72 *10*	100 *8*	1485.8	(21/2⁻)	Q[@]			
2139.8	(23/2⁺)	272.02 *10*	15.3 *18*	1867.7	(21/2⁺)				
		577.73 *10*	100 *8*	1562.1	(19/2⁺)				
		653.8 *10*	15.2 *20*	1485.8	(21/2⁻)				
2199.6	(21/2⁺)	263.3 *10*	100 *10*	1936.5	(17/2⁺)	(Q)[@]			
		529.8 *10*	29 *4*	1669.9	(19/2⁺)	(D)[@]			
		697.8 *10*	47 *26*	1501.71	(17/2⁺)				
2228.4	(23/2⁺)	666.3 *10*	100 *38*	1562.1	(19/2⁺)				
		742.5 *10*	80 *20*	1485.8	(21/2⁻)				
2276.7	(23/2⁺)	606.85 *10*	100	1669.9	(19/2⁺)				
2307.6	(27/2⁻)	203.23 *10*	13.7 *20*	2104.4	(25/2⁻)	(M1+E2)[a]	+0.30 *8*	0.476 *13*	B(M1)(W.u.)=(0.227 *10*); B(E2)(W.u.)=(2.4×10^2 *12*)
		630.14 *10*	100 *5*	1677.4	(23/2⁻)	E2[@]		0.01060	B(E2)(W.u.)=74 *+32−20*
2339.7	(23/2⁺)	319.1[d] *10*	50 *38*	2020.6	(21/2⁺)				
		609.6 *10*	100 *88*	1730.1	(19/2⁺)				
2400.5	(25/2⁺)	172.2 *10*	20.5 *25*	2228.4	(23/2⁺)				
		260.84 *10*	100 *8*	2139.8	(23/2⁺)				
		379.9 *10*	31 *3*	2020.6	(21/2⁺)				
		391.5 *10*	12.1 *25*	2009.0	(21/2⁺)				
		532.82 *10*	53 *5*	1867.7	(21/2⁺)				
		723.1 *10*	57 *5*	1677.4	(23/2⁻)	D[#]			
2410.8	(21/2⁺)	680.7 *10*	100	1730.1	(19/2⁺)				
2437.1	(23/2⁺)	706.9 *10*	100 *88*	1730.1	(19/2⁺)				
		951.2 *10*	62 *62*	1485.8	(21/2⁻)				
2488.6	(25/2⁺)	479.5[d] *10*	8 *7*	2009.0	(21/2⁺)				
		620.9 *10*	100 *13*	1867.7	(21/2⁺)				
2514.5	(25/2⁺)	314.85 *10*	100 *13*	2199.6	(21/2⁺)	(E2)[@]		0.0662	B(E2)(W.u.)=7.7×10^2 *+18−21*
		426.8 *3*	23 *4*	2087.6	(21/2⁺)	(E2)[@]		0.0281	B(E2)(W.u.)=39 *+10−12*
		505.8 *10*	5.1 *26*	2009.0	(21/2⁺)				
2540.8	(25/2⁺)	103.76 *10*	54 *8*	2437.1	(23/2⁺)				
		130.0 *10*	69 *15*	2410.8	(21/2⁺)				
		140.3 *10*	77 *7*	2400.5	(25/2⁺)				
		863.38 *10*	100 *46*	1677.4	(23/2⁻)				
2614.6	(27/2⁺)	214.00 *10*	100 *9*	2400.5	(25/2⁺)				
		386.2 *10*	11.6 *17*	2228.4	(23/2⁺)				
		474.73 *10*	58 *5*	2139.8	(23/2⁺)				
		510.1 *10*	27 *3*	2104.4	(25/2⁻)				
2681.1	(27/2⁺)	140.26 *10*	100 *12*	2540.8	(25/2⁺)				
		244.02 *10*	32 *5*	2437.1	(23/2⁺)				
		280.5 *10*	17.5 *17*	2400.5	(25/2⁺)				

From ENSDF

$^{163}_{71}Lu_{92}$-11

Adopted Levels, Gammas (continued)

γ(^{163}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[c]	Comments
2681.1	(27/2$^+$)	541.4 *10*	17.5 *17*	2139.8	(23/2$^+$)				
2685.7	(27/2$^+$)	545.9 *10*	100 *12*	2139.8	(23/2$^+$)				
		581.2 *10*	13 *7*	2104.4	(25/2$^-$)				
2748.3	(29/2$^-$)	440.61 *10*	69 *7*	2307.6	(27/2$^-$)	(D)[a]			δ(Q/D)=−0.01 *13*.
		643.81 *10*	100 *9*	2104.4	(25/2$^-$)	(Q)[@]			
2773.5	(27/2$^+$)	496.72 *19*	100	2276.7	(23/2$^+$)				
2803.7	(29/2$^+$)	117.9 *10*	3.8 *16*	2685.7	(27/2$^+$)				
		188.99 *10*	100 *14*	2614.6	(27/2$^+$)				
		314.9 *10*	9.1 *21*	2488.6	(25/2$^+$)				
		403.20 *10*	70 *6*	2400.5	(25/2$^+$)				
2855.4	(29/2$^-$)	751.2 *10*	100	2104.4	(25/2$^-$)				
2861.2	(29/2$^+$)	180.2 *10*	100 *9*	2681.1	(27/2$^+$)				
		246.7 *10*	10.2 *10*	2614.6	(27/2$^+$)				
		320.44 *10*	42 *9*	2540.8	(25/2$^+$)				
2900.8	(29/2$^+$)	386.31 *10*	100	2514.5	(25/2$^+$)	(E2)[@]		0.0368	B(E2)(W.u.)=5.2×10^2 *+9−12*
2925.0	(31/2$^-$)	176.85 *10*	14.1 *16*	2748.3	(29/2$^-$)	(D)[#]			
		617.48 *10*	100 *7*	2307.6	(27/2$^-$)	Q[@]			
3004.1	(31/2$^+$)	200.42 *10*	100 *10*	2803.7	(29/2$^+$)				
		318.4 *10*	1.6 *13*	2685.7	(27/2$^+$)				
		389.66 *11*	46 *4*	2614.6	(27/2$^+$)				
3021.5	(31/2$^-$)	166.1 *10*	7.3 *18*	2855.4	(29/2$^-$)				
		714.0 *10*	100 *14*	2307.6	(27/2$^-$)				
3078.4	(31/2$^+$)	217.17 *10*	100 *10*	2861.2	(29/2$^+$)				
		304.6 *10*	28 *3*	2773.5	(27/2$^+$)				
		397.34 *10*	93 *10*	2681.1	(27/2$^+$)				
3079.3	(27/2$^+$)	564.8 *10*	100	2514.5	(25/2$^+$)	(E2+M1)	−3.1 *4*	0.0155 *6*	
3123.4	(33/2$^-$)	102.0 *10*	6.3 *8*	3021.5	(31/2$^-$)				
		198.56 *10*	100 *12*	2925.0	(31/2$^-$)	(D)[#]			
		268.1 *10*	10 *3*	2855.4	(29/2$^-$)				
		374.74 *10*	20.2 *25*	2748.3	(29/2$^-$)				E_γ: poor fit, level-energy difference=375.07.
3130.7	(31/2$^+$)	357.1 *10*	100	2773.5	(27/2$^+$)				
3245.2	(33/2$^+$)	241.1 *10*	99 *8*	3004.1	(31/2$^+$)				
		441.54 *10*	100 *8*	2803.7	(29/2$^+$)				
3320.8	(35/2$^-$)	197.29 *10*	100 *17*	3123.4	(33/2$^-$)	(M1)[#]		0.538	B(M1)(W.u.)=0.39 *+11−10*
		299.3 *10*	0.8 *6*	3021.5	(31/2$^-$)	[E2]		0.0771 *14*	B(E2)(W.u.)=6 *4*
		395.99 *10*	20 *3*	2925.0	(31/2$^-$)	[E2]		0.0344	B(E2)(W.u.)=30 *3*
3323.9	(33/2$^+$)	245.48 *10*	100 *24*	3078.4	(31/2$^+$)				
		462.66 *10*	82 *29*	2861.2	(29/2$^+$)				
3351.1	(33/2$^+$)	450.30 *10*	100	2900.8	(29/2$^+$)	[E2]		0.0243	B(E2)(W.u.)=6.3×10^2 *+21−35*
3418.8	(33/2$^-$)	397.3 *10*	100 *15*	3021.5	(31/2$^-$)				

From ENSDF

$^{163}_{71}Lu_{92}$-12

Adopted Levels, Gammas (continued)

γ(^{163}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[c]	Comments
3418.8	(33/2$^-$)	563.4 *10*	38 *10*	2855.4	(29/2$^-$)				
		670.7 *10*	96 *15*	2748.3	(29/2$^-$)				
3483.8	(35/2$^+$)	238.6 *10*	70 *6*	3245.2	(33/2$^+$)				
		479.68 *10*	100 *8*	3004.1	(31/2$^+$)				
3486.6	(31/2$^+$)	407.4 *10*	69 *26*	3079.3	(27/2$^+$)				
		585.9 *10*	100 *35*	2900.8	(29/2$^+$)	(E2+M1)	−3.1 *4*	0.0142 *5*	α(K)=0.0116 *4*; α(L)=0.00216 *5*
3551.9	(37/2$^-$)	231.04 *10*	100 *7*	3320.8	(35/2$^-$)	(D)[#]			δ(Q/D)=+0.25 *5*.
		428.44 *10*	27.8 *22*	3123.4	(33/2$^-$)				
3572.1	(35/2$^+$)	248.20 *10*	37 *8*	3323.9	(33/2$^+$)				
		441.3 *10*	57 *10*	3130.7	(31/2$^+$)				
		493.68 *10*	100 *14*	3078.4	(31/2$^+$)				
3635.8	(35/2$^+$)	312.0 *10*	100 *17*	3323.9	(33/2$^+$)				
		505.0 *10*	67 *13*	3130.7	(31/2$^+$)				
		557.4 *10*	83 *20*	3078.4	(31/2$^+$)				
3667.8	(35/2$^-$)	249.0 *10*	25 *5*	3418.8	(33/2$^-$)				
		646.3 *10*	100 *14*	3021.5	(31/2$^-$)				
		742.9 *10*	37 *5*	2925.0	(31/2$^-$)				
3789.9	(37/2$^+$)	306.06 *10*	100 *8*	3483.8	(35/2$^+$)				
		544.72 *10*	87 *7*	3245.2	(33/2$^+$)				
3822.7	(39/2$^-$)	270.87 *10*	100 *6*	3551.9	(37/2$^-$)	(D)[#]			δ(Q/D)=+0.22 *3*.
		501.93 *10*	41 *3*	3320.8	(35/2$^-$)	(Q)[@]			Iγ(502)/Iγ(271)=0.70 *6* (1992Sc03) is in disagreement.
3863.6	(33/2$^+$)	377.0[d] *10*	33 *27*	3486.6	(31/2$^+$)				
		962.8 *10*	100 *47*	2900.8	(29/2$^+$)				
3866.4	(37/2$^+$)	515.30 *10*	100	3351.1	(33/2$^+$)	[E2]		0.01722	B(E2)(W.u.)=9.E+2 *+4−5*
3892.6	(37/2$^+$)	320.4 *10*	100 *27*	3572.1	(35/2$^+$)				
		568.6 *10*	41 *14*	3323.9	(33/2$^+$)				
3958.3	(35/2$^+$)	471.60 *17*	100 *7*	3486.6	(31/2$^+$)				
		607.1 *10*	83 *6*	3351.1	(33/2$^+$)	(E2+M1)	−3.1 *4*	0.0130 *5*	
3996.0	(37/2$^-$)	328.2 *10*	100 *14*	3667.8	(35/2$^-$)				
		577.2 *10*	88 *14*	3418.8	(33/2$^-$)				
4068.3	(39/2$^+$)	278.40 *10*	64 *5*	3789.9	(37/2$^+$)				
		584.45 *10*	100 *8*	3483.8	(35/2$^+$)				
4103.9	(41/2$^-$)	281.18 *10*	100 *7*	3822.7	(39/2$^-$)	(D)[#]			
		552.09 *10*	59 *4*	3551.9	(37/2$^-$)	(Q)[@]			Iγ(552)/Iγ(281)=0.91 *14* (1992Sc03) is in disagreement.
4150.8	(39/2$^+$)	258.2 *10*	11 *4*	3892.6	(37/2$^+$)				
		578.71 *10*	100 *13*	3572.1	(35/2$^+$)				
4253.8	(39/2$^-$)	257.8 *10*	53 *8*	3996.0	(37/2$^-$)				
		586.0 *10*	100 *15*	3667.8	(35/2$^-$)				
4255.6	(39/2$^+$)	363.0 *10*	80 *32*	3892.6	(37/2$^+$)				
		619.8 *10*	100 *48*	3635.8	(35/2$^+$)				

From ENSDF

$^{163}_{71}Lu_{92}$-13

Adopted Levels, Gammas (continued)

γ(^{163}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[c]	Comments
4255.6	(39/2$^+$)	683.6[d] *10*	48 *32*	3572.1	(35/2$^+$)				
4309.3	(37/2$^-$)	757.6 *10*	100 *7*	3551.9	(37/2$^-$)	(M1)		0.01539	
		988.6 *10*	9 *7*	3320.8	(35/2$^-$)				
4369.2	(37/2$^+$)	410.9[d] *10*	19 *15*	3958.3	(35/2$^+$)				
		505.5 *10*	100 *38*	3863.6	(33/2$^+$)				
		1018.1 *10*	69 *23*	3351.1	(33/2$^+$)	Q[@]			
4405.9	(41/2$^+$)	337.7 *10*	58 *14*	4068.3	(39/2$^+$)				
		616.17 *10*	100 *8*	3789.9	(37/2$^+$)				
4431.4	(43/2$^-$)	327.58 *10*	100 *10*	4103.9	(41/2$^-$)	(D)[#]			
		608.77 *10*	99 *8*	3822.7	(39/2$^-$)	Q[@]			
4445.0	(41/2$^+$)	578.65 *10*	100	3866.4	(37/2$^+$)	[E2]		0.01296	B(E2)(W.u.)=6.5×10^2 *+19−13*
4492.6	(39/2$^+$)	534.3 *10*	100 *7*	3958.3	(35/2$^+$)				
		626.2 *10*	49 *3*	3866.4	(37/2$^+$)	(E2+M1)	−3.1 *4*	0.0121 *5*	
4529.5	(41/2$^+$)	636.8 *10*	100	3892.6	(37/2$^+$)				
4556.6	(41/2$^-$)	302.8 *10*	100 *17*	4253.8	(39/2$^-$)				
		560.6 *10*	96 *17*	3996.0	(37/2$^-$)				
		1004.8 *10*	75 *25*	3551.9	(37/2$^-$)				
4579.0	(39/2$^-$)	269.7 *10*	100 *23*	4309.3	(37/2$^-$)				
		756.4 *10*	91 *21*	3822.7	(39/2$^-$)	(M1)		0.01546	
		1027.1 *10*	16 *7*	3551.9	(37/2$^-$)				
4719.7	(43/2$^+$)	313.68 *10*	35 *3*	4405.9	(41/2$^+$)				
		651.30 *10*	100 *7*	4068.3	(39/2$^+$)				
4760.7	(45/2$^-$)	329.22 *10*	60 *9*	4431.4	(43/2$^-$)	[#]			
		656.60 *10*	100 *8*	4103.9	(41/2$^-$)	[@]			
4817.3	(43/2$^+$)	666.54 *10*	100	4150.8	(39/2$^+$)				
4831.2	(41/2$^-$)	252.2 *10*	100 *25*	4579.0	(39/2$^-$)				
		522.0 *10*	73 *17*	4309.3	(37/2$^-$)				
		727.3 *10*	48 *10*	4103.9	(41/2$^-$)	(M1)		0.01706	
4849.0	(43/2$^-$)	292.4 *10*	73 *10*	4556.6	(41/2$^-$)				
		595.2 *10*	100 *17*	4253.8	(39/2$^-$)				
		1026.3 *10*	57 *10*	3822.7	(39/2$^-$)				
4904.1	(43/2$^+$)	374.5 *10*	100 *30*	4529.5	(41/2$^+$)				
		648.5 *10*	100 *27*	4255.6	(39/2$^+$)				
4937.2	(41/2$^+$)	444.6 *10*	19 *6*	4492.6	(39/2$^+$)				
		568.0 *10*	100 *19*	4369.2	(37/2$^+$)				
		1070.8 *10*	31 *9*	3866.4	(37/2$^+$)				
5057.5	(45/2$^+$)	337.83 *10*	60 *13*	4719.7	(43/2$^+$)				
		652.59 *21*	100 *8*	4405.9	(41/2$^+$)				E_γ: poor fit, level-energy difference=651.59.
5084.0	(45/2$^+$)	638.96 *10*	100	4445.0	(41/2$^+$)	[E2]		0.01026	B(E2)(W.u.)=5.7×10^2 *+9−8*
5088.3	(43/2$^+$)	595.8 *10*	100 *7*	4492.6	(39/2$^+$)				

From ENSDF

$^{163}_{71}Lu_{92}$-14

Adopted Levels, Gammas (continued)

γ(^{163}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[c]	Comments
5088.3	(43/2$^+$)	643.3 *10*	35.8 *25*	4445.0	(41/2$^+$)	(E2+M1)	−3.1 *4*	0.0113 *4*	
5116.1	(43/2$^-$)	285.1 *10*	100 *26*	4831.2	(41/2$^-$)				
		537.3 *10*	91 *22*	4579.0	(39/2$^-$)				
		684.3 *10*	22 *17*	4431.4	(43/2$^-$)				
		1012.2 *10*	30 *13*	4103.9	(41/2$^-$)	D			
5131.8	(47/2$^-$)	370.95 *10*	100 *12*	4760.7	(45/2$^-$)	[M1]		0.100	α(K)=0.083 *3*; α(L)=0.0125 *4*; α(M)=0.00281 *9*; α(N+..)=0.00086 *3* B(M1)(W.u.)=1.4 *6*
		700.67 *10*	89 *8*	4431.4	(43/2$^-$)	[E2]		0.00831	B(E2)(W.u.)=1.9×10^2 *7*
5168.8	(45/2$^-$)	319.8 *10*	81 *19*	4849.0	(43/2$^-$)				
		612.1 *10*	100 *19*	4556.6	(41/2$^-$)				
		1064.9 *10*	81 *19*	4103.9	(41/2$^-$)				
5209.6	(45/2$^+$)	305.6 *10*	30 *22*	4904.1	(43/2$^+$)				
		392.4 *10*	100 *30*	4817.3	(43/2$^+$)				
		680.1 *10*	63 *19*	4529.5	(41/2$^+$)				
5243.4	(45/2$^+$)	713.8 *10*	100	4529.5	(41/2$^+$)				
5387.9	(47/2$^+$)	330.37 *10*	64 *7*	5057.5	(45/2$^+$)				
		667.97 *10*	100 *10*	4719.7	(43/2$^+$)				
5419.5	(45/2$^-$)	303.3 *10*	84 *22*	5116.1	(43/2$^-$)				
		588.4 *10*	100 *25*	4831.2	(41/2$^-$)				
		658.8 *10*	16 *16*	4760.7	(45/2$^-$)				
5496.2	(47/2$^-$)	327.5 *10*	67 *19*	5168.8	(45/2$^-$)				
		647.2 *10*	100 *19*	4849.0	(43/2$^-$)				
		1064.7 *10*	33 *14*	4431.4	(43/2$^-$)				
5505.1	(49/2$^-$)	373.35 *14*	86 *7*	5131.8	(47/2$^-$)	[M1]		0.0953	B(M1)(W.u.)=1.7 *+5−8* Iγ(373)/Iγ(744)=0.41 *11* (1992Sc03) is in disagreement.
		744.31 *10*	100 *8*	4760.7	(45/2$^-$)	[E2]		0.00727	B(E2)(W.u.)=2.2×10^2 *+7−11*
5557.4	(47/2$^+$)	347.9 *10*	58 *39*	5209.6	(45/2$^+$)				
		653.4 *10*	68 *16*	4904.1	(43/2$^+$)				
		740.0 *10*	100 *16*	4817.3	(43/2$^+$)				
5559.5	(47/2$^+$)	655.4 *10*	17 *11*	4904.1	(43/2$^+$)				
		742.20 *10*	100 *19*	4817.3	(43/2$^+$)				
5564.2	(45/2$^+$)	475.9 *10*	14 *4*	5088.3	(43/2$^+$)	(M1+E2)	−3.6 *+10−19*	0.0232 *18*	
		626.8 *10*	100 *20*	4937.2	(41/2$^+$)				
		1119.2 *3*	25 *6*	4445.0	(41/2$^+$)	(Q)[@]			
5720.1	(49/2$^+$)	332.1 *10*	57 *6*	5387.9	(47/2$^+$)				
		662.85 *10*	100 *11*	5057.5	(45/2$^+$)				
5742.9	(47/2$^+$)	654.6 *10*	100 *6*	5088.3	(43/2$^+$)	[E2]		0.00970	B(E2)(W.u.)=4.8×10^2 *+12−10*
		658.9 *10*	24.3 *21*	5084.0	(45/2$^+$)	(E2+M1)	−3.1 *4*	0.0107 *4*	B(M1)(W.u.)=(0.0094 *22*); B(E2)(W.u.)=(101.4 *25*)
5757.0	(47/2$^-$)	337.4 *10*	74 *18*	5419.5	(45/2$^-$)				
		640.7 *10*	100 *26*	5116.1	(43/2$^-$)				
		996.4 *10*	15 *12*	4760.7	(45/2$^-$)				

From ENSDF

$^{163}_{71}Lu_{92}$-15

Adopted Levels, Gammas (continued)

γ(^{163}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[c]	Comments
5781.0	(49/2$^+$)	696.97 *10*	100	5084.0	(45/2$^+$)	[E2]		0.00841	B(E2)(W.u.)=4.6×10^2 *+6−5*
5853.1	(49/2$^-$)	356.9 *10*	65 *24*	5496.2	(47/2$^-$)				
		684.3 *10*	100 *24*	5168.8	(45/2$^-$)				
		1092.4 *10*	12 *6*	4760.7	(45/2$^-$)				
5898.2	(49/2$^+$)	338.8 *10*	75 *13*	5559.5	(47/2$^+$)				
		340.8 *10*	63 *38*	5557.4	(47/2$^+$)				
		688.5 *10*	100 *44*	5209.6	(45/2$^+$)				
5916.9	(51/2$^-$)	411.55 *10*	91 *10*	5505.1	(49/2$^-$)	[M1]		0.0737	B(M1)(W.u.)=1.2 *+7−4*
		785.18 *10*	100 *11*	5131.8	(47/2$^-$)	[E2]		0.00647	B(E2)(W.u.)=1.5×10^2 *+8−5*
6006.1	(49/2$^+$)	446.6 *10*	21 *13*	5559.5	(47/2$^+$)				
		762.7 *10*	6 *4*	5243.4	(45/2$^+$)				
		796.4 *10*	100 *32*	5209.6	(45/2$^+$)				
6065.3	(51/2$^+$)	345.44 *10*	62 *7*	5720.1	(49/2$^+$)				
		677.14 *10*	100 *10*	5387.9	(47/2$^+$)				
6108.2	(49/2$^-$)	351.2 *10*	50 *13*	5757.0	(47/2$^-$)				
		688.7 *10*	100 *25*	5419.5	(45/2$^-$)				
6223.5	(51/2$^-$)	370.4 *10*	56 *19*	5853.1	(49/2$^-$)				
		727.3 *10*	100 *25*	5496.2	(47/2$^-$)				
6246.5	(51/2$^+$)	348.3 *10*	78 *29*	5898.2	(49/2$^+$)				
		686.8 *10*	17 *14*	5559.5	(47/2$^+$)				
		689.1 *10*	100 *22*	5557.4	(47/2$^+$)				
6249.3	(49/2$^+$)	685.1 *10*	100 *19*	5564.2	(45/2$^+$)				
		1165.3 *10*	24 *6*	5084.0	(45/2$^+$)	Q[@]			
6319.9	(47/2$^-$)	1235.9 *10*	100	5084.0	(45/2$^+$)	(D)			
6334.1	(53/2$^-$)	417.20 *10*	64 *8*	5916.9	(51/2$^-$)	[M1]		0.0711	B(M1)(W.u.)=1.3 *+6−9*
		829.00 *10*	100 *10*	5505.1	(49/2$^-$)	[E2]		0.00575	B(E2)(W.u.)=1.8×10^2 *+9−13*
6355.9	(51/2$^+$)	796.4 *10*	100	5559.5	(47/2$^+$)				
6415.1	(53/2$^+$)	349.62 *10*	65 *6*	6065.3	(51/2$^+$)				Iγ(350)/Iγ(695)=0.37 *7* (1992Sc03) is in disagreement.
		694.96 *10*	100 *10*	5720.1	(49/2$^+$)				
6454.2	(51/2$^+$)	673.2 *10*	25 *7*	5781.0	(49/2$^+$)	(E2+M1)	−3.1 *4*	0.0102 *4*	B(M1)(W.u.)=(0.013 *3*); B(E2)(W.u.)=(1.4×10^2 *4*)
		711.2 *10*	100 *15*	5742.9	(47/2$^+$)	[E2]		0.00804	B(E2)(W.u.)=4.7×10^2 *+12−11*
6502.7	(51/2$^-$)	394.5 *10*	51 *14*	6108.2	(49/2$^-$)				
		745.7 *10*	100 *26*	5757.0	(47/2$^-$)				
6533.6	(53/2$^+$)	752.61 *10*	100	5781.0	(49/2$^+$)	[E2]		0.00709	B(E2)(W.u.)=5.4×10^2 *+5−4*
6616.5	(53/2$^+$)	370.0 *10*	73 *40*	6246.5	(51/2$^+$)				
		718.4 *10*	100 *27*	5898.2	(49/2$^+$)				
6618.0	(53/2$^-$)	394.5 *10*	50 *21*	6223.5	(51/2$^-$)				
		764.9 *10*	100 *29*	5853.1	(49/2$^-$)				
6719.1	(53/2$^+$)	363.3 *10*	71 *43*	6355.9	(51/2$^+$)				
		713.0 *10*	100 *57*	6006.1	(49/2$^+$)				
6788.9	(55/2$^+$)	373.74 *10*	43 *4*	6415.1	(53/2$^+$)				Iγ(374)/Iγ(724)=1.2 *4* (1992Sc03) is in disagreement.

From ENSDF

$^{163}_{71}Lu_{92}$-16

Adopted Levels, Gammas (continued)

γ(^{163}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[c]	Comments
6788.9	(55/2$^+$)	723.69 *10*	100 *10*	6065.3	(51/2$^+$)				
6790.0	(55/2$^-$)	456.0 *10*	100 *11*	6334.1	(53/2$^-$)				
		872.8 *10*	100 *11*	5916.9	(51/2$^-$)				
6907.4	(53/2$^-$)	404.7 *10*	42 *12*	6502.7	(51/2$^-$)				
		799.2 *10*	100 *23*	6108.2	(49/2$^-$)				
6965.0	(51/2$^-$)	645.0 *10*	100 *27*	6319.9	(47/2$^-$)				
		1184.0 *10*	100 *33*	5781.0	(49/2$^+$)	D			
6980.1	(55/2$^+$)	363.6 *10*	64 *21*	6616.5	(53/2$^+$)				
		733.5 *10*	100 *21*	6246.5	(51/2$^+$)				
6990.5	(53/2$^+$)	741.2 *10*	100 *19*	6249.3	(49/2$^+$)				
		1209.5 *10*	25 *9*	5781.0	(49/2$^+$)	Q[@]			
7035.4	(55/2$^-$)	417.5 *10*	47 *27*	6618.0	(53/2$^-$)				
		811.9 *10*	100 *33*	6223.5	(51/2$^-$)				
7133.1	(55/2$^+$)	414.0 *10*	62 *38*	6719.1	(53/2$^+$)				
		777.3 *10*	100 *88*	6355.9	(51/2$^+$)				
7174.2	(57/2$^+$)	385.54 *10*	49 *10*	6788.9	(55/2$^+$)				
		758.85 *12*	100 *11*	6415.1	(53/2$^+$)				
7179.1	(55/2$^+$)	823.19 *10*	100	6355.9	(51/2$^+$)				
7220.4	(55/2$^+$)	686.8 *10*	15 *4*	6533.6	(53/2$^+$)	(E2+M1)	−3.1 *4*	0.0097 *4*	B(M1)(W.u.)=(0.013 *3*); B(E2)(W.u.)=(1.2×10^2 *2*)
		766.2 *10*	100 *18*	6454.2	(51/2$^+$)	[E2]		0.00682	B(E2)(W.u.)=5.3×10^2 *+16−15*
7246.9	(57/2$^-$)	456.8 *10*	16 *8*	6790.0	(55/2$^-$)				
		913.0 *10*	100 *11*	6334.1	(53/2$^-$)				
7339.1	(57/2$^+$)	805.57 *10*	100	6533.6	(53/2$^+$)	[E2]		0.00612	B(E2)(W.u.)=4.7×10^2 *6*
7351.2	(55/2$^-$)	443.8 *10*	53 *26*	6907.4	(53/2$^-$)				
		848.5 *10*	100 *26*	6502.7	(51/2$^-$)				
7391.0	(57/2$^+$)	410.9 *10*	68 *14*	6980.1	(55/2$^+$)				
		774.5 *10*	100 *14*	6616.5	(53/2$^+$)				
7466.8	(57/2$^-$)	431.4 *10*	36 *27*	7035.4	(55/2$^-$)				
		848.9 *10*	100 *27*	6618.0	(53/2$^-$)				
7507.0	(57/2$^+$)	373.9 *10*	100 *80*	7133.1	(55/2$^+$)				
		787.9 *10*	100 *60*	6719.1	(53/2$^+$)				
7584.4	(59/2$^+$)	410.21 *11*	51 *5*	7174.2	(57/2$^+$)				Iγ(410)/Iγ(795)=1.01 *17* (1992Sc03) is in disagreement.
		795.48 *15*	100 *10*	6788.9	(55/2$^+$)				
7667.2	(55/2$^-$)	702.2 *10*	100 *64*	6965.0	(51/2$^-$)				
		1133.6 *10*	44 *16*	6533.6	(53/2$^+$)	(D)			
7729.3	(59/2$^-$)	482.4 *10*	14 *11*	7246.9	(57/2$^-$)				
		939.2 *10*	100 *29*	6790.0	(55/2$^-$)				
7785.3	(59/2$^+$)	394.3 *10*	47 *13*	7391.0	(57/2$^+$)				
		805.3 *10*	100 *13*	6980.1	(55/2$^+$)				
7786.4	(57/2$^+$)	795.9 *10*	100 *20*	6990.5	(53/2$^+$)				
		1252.8 *10*	20 *7*	6533.6	(53/2$^+$)				

From ENSDF

$^{163}_{71}Lu_{92}$-17

Adopted Levels, Gammas (continued)

γ(^{163}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[&]	α[c]	Comments
7813.9	(57/2⁻)	462.7 *10*	29 *18*	7351.2	(55/2⁻)				
		906.5 *10*	100 *24*	6907.4	(53/2⁻)				
7903.4	(59/2⁻)	436.6 *10*	36 *27*	7466.8	(57/2⁻)				
		868.0 *10*	100 *27*	7035.4	(55/2⁻)				
7955.9	(59/2⁺)	448.8 *10*	80 *80*	7507.0	(57/2⁺)				
		822.7 *10*	100 *80*	7133.1	(55/2⁺)				
8011.1	(61/2⁺)	426.45 *14*	48 *5*	7584.4	(59/2⁺)				
		837.45 *22*	100 *10*	7174.2	(57/2⁺)				
8040.3	(59/2⁺)	701.1 *10*	12 *4*	7339.1	(57/2⁺)	(E2+M1)	−3.1 *4*	0.0093 *3*	B(M1)(W.u.)=(0.011 *+7−6*); B(E2)(W.u.)=(1.0×10^2 *+6−5*)
		819.9 *10*	100 *16*	7220.4	(55/2⁺)	[E2]		0.00589	B(E2)(W.u.)=4.3×10^2 *+21−16*
8046.1	(59/2⁺)	867.05 *10*	100	7179.1	(55/2⁺)				
8196.9	(61/2⁺)	857.7 *10*	100	7339.1	(57/2⁺)	[E2]		0.00535	B(E2)(W.u.)=3.8×10^2 *3*
8222.8	(61/2⁻)	493.5 *10*	20 *16*	7729.3	(59/2⁻)				
		975.9 *10*	100 *52*	7246.9	(57/2⁻)				
8237.3	(61/2⁺)	452.0 *10*	57 *13*	7785.3	(59/2⁺)				
		846.3 *10*	100 *13*	7391.0	(57/2⁺)				
8291.2	(59/2⁻)	477.3 *10*	38 *31*	7813.9	(57/2⁻)				
		940.0 *10*	100 *23*	7351.2	(55/2⁻)				
8379.8	(61/2⁻)	913.0 *10*	100	7466.8	(57/2⁻)				
8387.2	(61/2⁺)	880.2 *10*	100	7507.0	(57/2⁺)				
8421.8	(59/2⁻)	754.6 *10*	100 *50*	7667.2	(55/2⁻)				
		1082.6 *10*	30 *10*	7339.1	(57/2⁺)	D			
8459.4	(63/2⁺)	447.9 *10*	51 *13*	8011.1	(61/2⁺)				I_γ: other: 23 *13* (1992Sc03).
		875.5 *10*	100 *11*	7584.4	(59/2⁺)				
8636.2	(61/2⁺)	849.8 *10*	100 *22*	7786.4	(57/2⁺)				
		1297.0[d] *10*	22 *14*	7339.1	(57/2⁺)				
8668.7	(63/2⁺)	431.4 *10*	57 *14*	8237.3	(61/2⁺)				
		883.4 *10*	100 *19*	7785.3	(59/2⁺)				
8713.6	(63/2⁻)	490.8 *10*	36 *29*	8222.8	(61/2⁻)				
		984.3 *10*	100 *43*	7729.3	(59/2⁻)				
8790.3	(61/2⁻)	499.1 *10*	44 *33*	8291.2	(59/2⁻)				
		976.4 *10*	100 *33*	7813.9	(57/2⁻)				
8845.6	(63/2⁻)	942.2 *10*	100	7903.4	(59/2⁻)				
8855.7	(63/2⁺)	899.9 *10*	100	7955.9	(59/2⁺)				
8913.2	(63/2⁺)	716.3 *10*	10 *5*	8196.9	(61/2⁺)	[M1+E2]		0.013 *5*	
		872.9 *10*	100 *23*	8040.3	(59/2⁺)	[E2]		0.00516	B(E2)(W.u.)=4.3×10^2 *+21−17*
8927.0	(65/2⁺)	467.7 *10*	56 *13*	8459.4	(63/2⁺)				
		915.6 *10*	100 *24*	8011.1	(61/2⁺)				
8974.2	(63/2⁺)	928.1 *10*	100	8046.1	(59/2⁺)				
9106.6	(65/2⁺)	909.7 *10*	100	8196.9	(61/2⁺)	[E2]		0.00473	B(E2)(W.u.)=3.7×10^2 *+8−6*
9154.2	(65/2⁺)	485.5 *10*	71 *29*	8668.7	(63/2⁺)				

From ENSDF

$^{163}_{71}Lu_{92}$-18

Adopted Levels, Gammas (continued)

$\gamma(^{163}Lu)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[&]	α[c]	Comments
9154.2	(65/2$^+$)	916.8 *10*	100 *29*	8237.3	(61/2$^+$)			
9231.8	(63/2$^-$)	810.1 *10*	100	8421.8	(59/2$^-$)			
9252.8	(65/2$^-$)	539.2 *10*	57 *43*	8713.6	(63/2$^-$)			
		1030.0 *10*	100 *57*	8222.8	(61/2$^-$)			
9284.6	(63/2$^-$)	993.4 *10*	100	8291.2	(59/2$^-$)			
9331.0	(65/2$^+$)	943.8 *10*	100	8387.2	(61/2$^+$)			
9376.3	(65/2$^-$)	996.5 *10*	100	8379.8	(61/2$^-$)			
9408.7	(67/2$^+$)	481.7 *10*	95 *33*	8927.0	(65/2$^+$)			
		949.4 *10*	100 *33*	8459.4	(63/2$^+$)			
9538.7	(65/2$^+$)	902.5 *10*	100	8636.2	(61/2$^+$)			
9625.5	(67/2$^+$)	471.3 *10*	100 *50*	9154.2	(65/2$^+$)			
		956.8 *10*	63 *37*	8668.7	(63/2$^+$)			
9709.0	(67/2$^-$)	456.2 *10*	20 *10*	9252.8	(65/2$^-$)			
		995.4 *10*	100 *50*	8713.6	(63/2$^-$)			
9805.3	(65/2$^-$)	1015.0 *10*	100	8790.3	(61/2$^-$)			
9816.2	(67/2$^+$)	960.5 *10*	100	8855.7	(63/2$^+$)			
9839.7	(67/2$^+$)	926.5 *10*	100	8913.2	(63/2$^+$)	[E2]	0.00455	B(E2)(W.u.)=3.0×10^2 *+10−7*
9916.8	(69/2$^+$)	508.0 *10*	24 *14*	9408.7	(67/2$^+$)			
		989.8 *10*	100 *33*	8927.0	(65/2$^+$)			
10069.2	(69/2$^+$)	962.53 *14*	100	9106.6	(65/2$^+$)	[E2]	0.00421	B(E2)(W.u.)=3.9×10^2 *+10−15*
10097.2	(67/2$^-$)	865.3 *10*	100	9231.8	(63/2$^-$)			
10138.5	(69/2$^+$)	513.0 *10*	50 *30*	9625.5	(67/2$^+$)			
		984.4 *10*	100 *50*	9154.2	(65/2$^+$)			
10314.7	(69/2$^-$)	1061.9 *10*	100	9252.8	(65/2$^-$)			
10333.9	(69/2$^+$)	1002.9 *10*	100	9331.0	(65/2$^+$)			
10428.3	(71/2$^+$)	511.6 *10*	50 *40*	9916.8	(69/2$^+$)			
		1019.6 *10*	100 *70*	9408.7	(67/2$^+$)			
10494.5	(69/2$^+$)	955.8 *10*	100	9538.7	(65/2$^+$)			
10653.5	(71/2$^+$)	515.0 *10*	50 *50*	10138.5	(69/2$^+$)			
		1028.0 *10*	100 *50*	9625.5	(67/2$^+$)			
10714.9	(71/2$^-$)	1005.9 *10*	100	9709.0	(67/2$^-$)			
10819.9	(71/2$^+$)	980.2 *10*	100	9839.7	(67/2$^+$)	[E2]	0.00406	B(E2)(W.u.)=3.0×10^2 *+16−10*
10876.3	(69/2$^-$)	1071.0 *10*	100	9805.3	(65/2$^-$)			
10978.4	(73/2$^+$)	550.1 *10*	50 *40*	10428.3	(71/2$^+$)			
		1061.6 *10*	100 *70*	9916.8	(69/2$^+$)			
11017.7	(71/2$^-$)	920.5 *10*	100	10097.2	(67/2$^-$)			
11085.7	(73/2$^+$)	1016.5 *10*	100	10069.2	(69/2$^+$)			
11186.8	(73/2$^+$)	1048.3 *10*		10138.5	(69/2$^+$)			
11503.7	(73/2$^+$)	1009.2 *10*	100	10494.5	(69/2$^+$)			
11505.4	(75/2$^+$)	527.0 *10*	50 *38*	10978.4	(73/2$^+$)			
		1077.1 *10*	100 *75*	10428.3	(71/2$^+$)			
11729.9	(75/2$^-$)	1015.0 *10*	100	10714.9	(71/2$^-$)	E2	0.00378	

From ENSDF

$^{163}_{71}Lu_{92}$-19

Adopted Levels, Gammas (continued)

γ(^{163}Lu) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
11749.0	(75/2$^+$)	1095.5 *10*	100	10653.5	(71/2$^+$)	
11781.4	(75/2$^-$)	1066.5 *10*	100	10714.9	(71/2$^-$)	
11854.6	(75/2$^+$)	1034.7 *10*	100	10819.9	(71/2$^+$)	
11993.4	(75/2$^-$)	975.7 *10*	100	11017.7	(71/2$^-$)	
12098.1	(77/2$^+$)	1119.7 *10*	100	10978.4	(73/2$^+$)	E_γ: 1117.4 (1992Sc03).
12156.8	(77/2$^+$)	1071.1 *10*	100	11085.7	(73/2$^+$)	
12266.9	(77/2$^+$)	1080.1 *10*	100	11186.8	(73/2$^+$)	
12566.7	(77/2$^+$)	1063.0 *10*	100	11503.7	(73/2$^+$)	
12627.2	(79/2$^+$)	1121.8 *10*	100	11505.4	(75/2$^+$)	
12745	(79/2$^-$)	1015.0 *20*	100	11729.9	(75/2$^-$)	
12862.4	(79/2$^+$)	1113.4 *10*	100	11749.0	(75/2$^+$)	
12866.0	(79/2$^-$)	1084.6 *10*	100	11781.4	(75/2$^-$)	
12943.5	(79/2$^+$)	1088.9 *10*		11854.6	(75/2$^+$)	
13025.0	(79/2$^-$)	1031.6 *10*		11993.4	(75/2$^-$)	
13198.3?	(81/2$^+$)	1100.2[d] *10*	100	12098.1	(77/2$^+$)	
13283.0	(81/2$^+$)	1126.2 *10*	100	12156.8	(77/2$^+$)	
13679.1	(81/2$^+$)	1112.4 *10*	100	12566.7	(77/2$^+$)	
13746.8	(83/2$^+$)	1119.6 *10*	100	12627.2	(79/2$^+$)	
13798	(83/2$^-$)	1052.8 *10*	100	12745	(79/2$^-$)	
14086.5	(83/2$^+$)	1143.0 *10*		12943.5	(79/2$^+$)	
14110?	(83/2$^-$)	1085.5[d] *10*	100	13025.0	(79/2$^-$)	
14462.3	(85/2$^+$)	1179.3 *10*	100	13283.0	(81/2$^+$)	
14826	(85/2$^+$)	1147 *4*	100	13679.1	(81/2$^+$)	
14890	(87/2$^-$)	1092.2 *10*	100	13798	(83/2$^-$)	
15284	(87/2$^+$)	1197.3 *10*	100	14086.5	(83/2$^+$)	
15689	(89/2$^+$)	1227.0 *10*	100	14462.3	(85/2$^+$)	
16024	(91/2$^-$)	1134.5 *10*	100	14890	(87/2$^-$)	
16531	(91/2$^+$)	1247.5 *10*	100	15284	(87/2$^+$)	
16958	(93/2$^+$)	1269.0 *10*	100	15689	(89/2$^+$)	
17204	(95/2$^-$)	1179.5 *10*	100	16024	(91/2$^-$)	
18262	(97/2$^+$)	1303.5 *10*	100	16958	(93/2$^+$)	
18436	(99/2$^-$)	1232.4 *10*	100	17204	(95/2$^-$)	

[†] From ^{139}La(^{29}Si,5nγ) unless otherwise stated. These values, in general, agree within 0.3 keV with those from ^{139}La(^{28}Si,4nγ).
[‡] Most values are from ^{139}La(^{29}Si,5nγ), where a more complete set of values is given than in earlier ^{139}La(^{28}Si,4nγ) study.
[§] From ^{163}Hf ε decay.
[&] From γ(θ), γγ(θ) and γ(lin pol) in (HI,xnγ) studies, except as noted.
[@] γγ(θ) (DCO ratio) in (HI,xnγ) is consistent with ΔJ=2, stretched quadrupole. When $T_{1/2}$(level) is known, RUL further limits the multipolarity to E2.
[#] γγ(θ) (DCO) in (HI,xnγ) is consistent with ΔJ=1, dipole, but ΔJ=2 does not seem to be ruled out.
[a] From γ(θ) in (HI,xnγ) (1983RoZW).

From ENSDF

$^{163}_{71}Lu_{92}$-20

Adopted Levels, Gammas (continued)

$\gamma(^{163}Lu)$ (continued)

[b] From comparison to RUL. Isotropic distribution in (^{19}F,4nγ).
[c] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[d] Placement of transition in the level scheme is uncertain.

From ENSDF

$^{163}_{71}Lu_{92}$-21

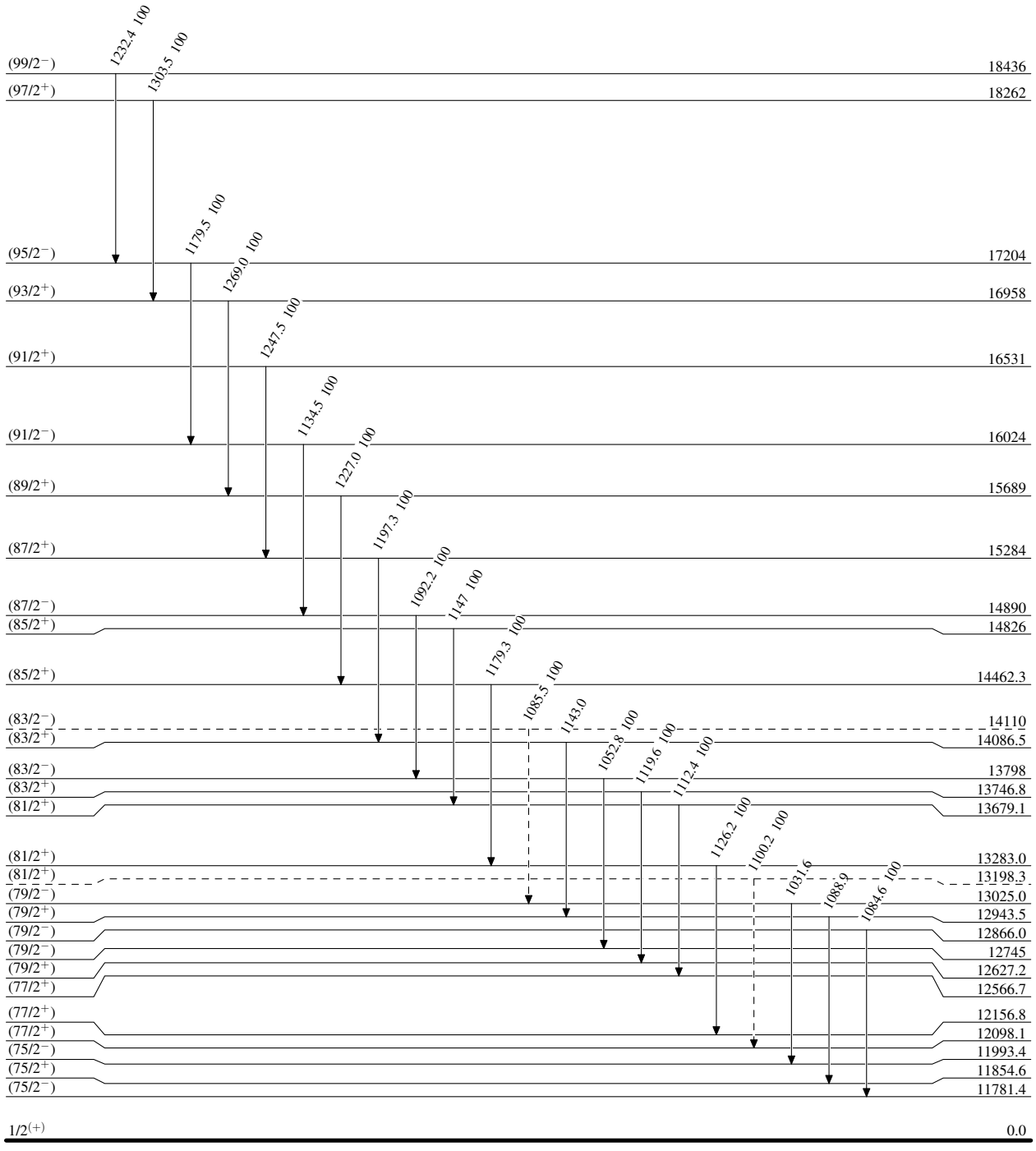
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

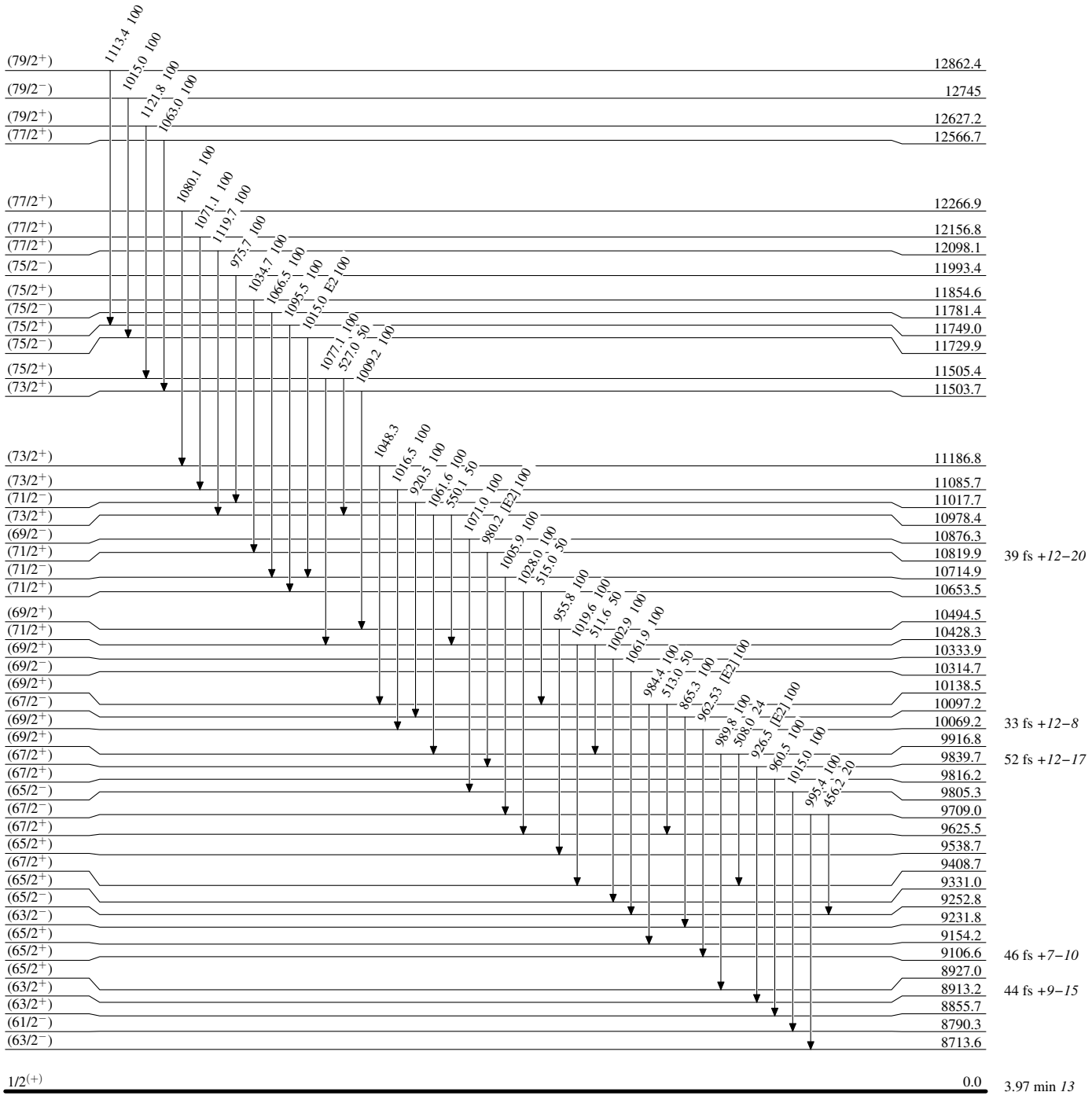


$^{163}_{71}Lu_{92}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{163}_{71}Lu_{92}$

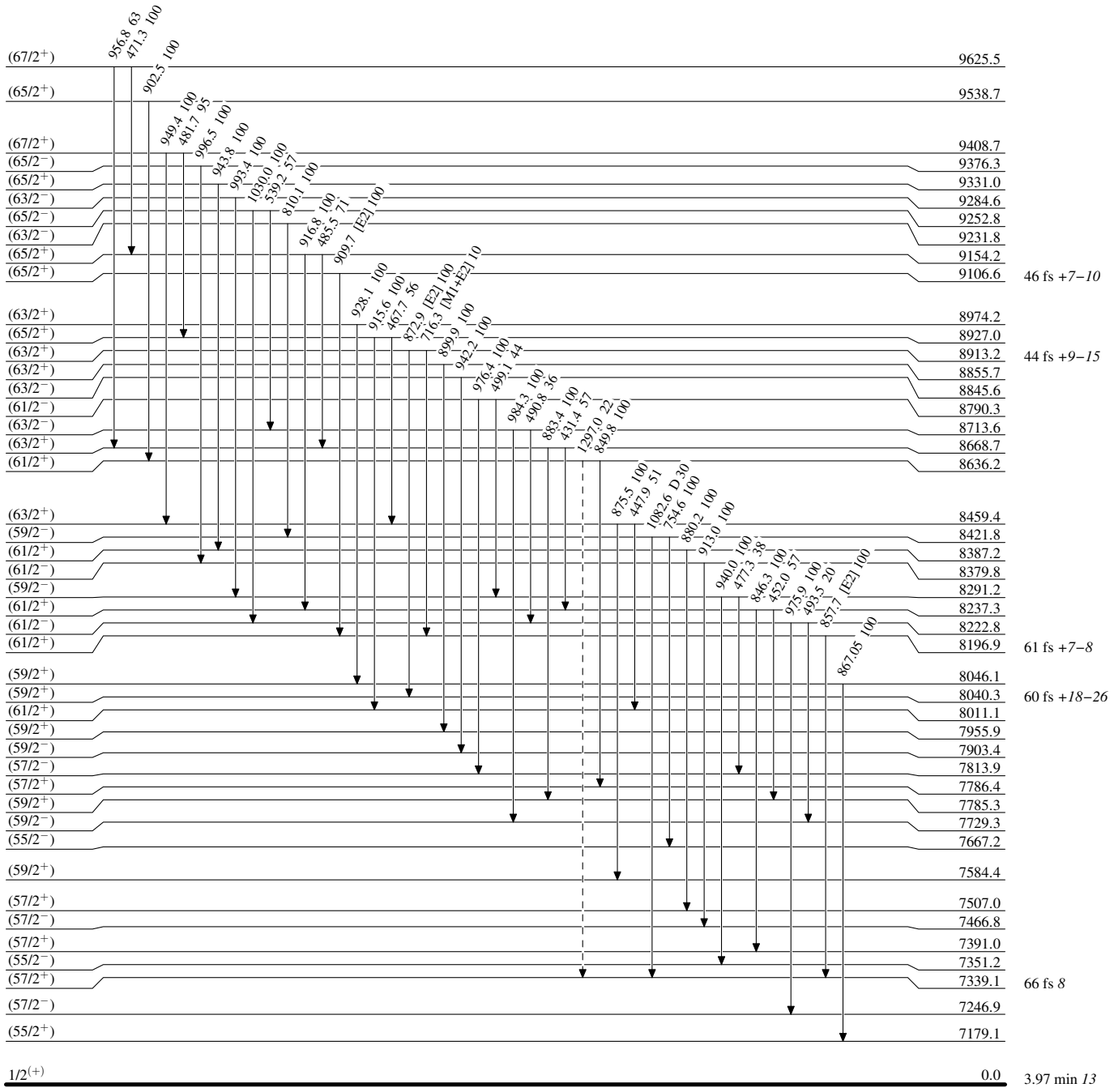
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

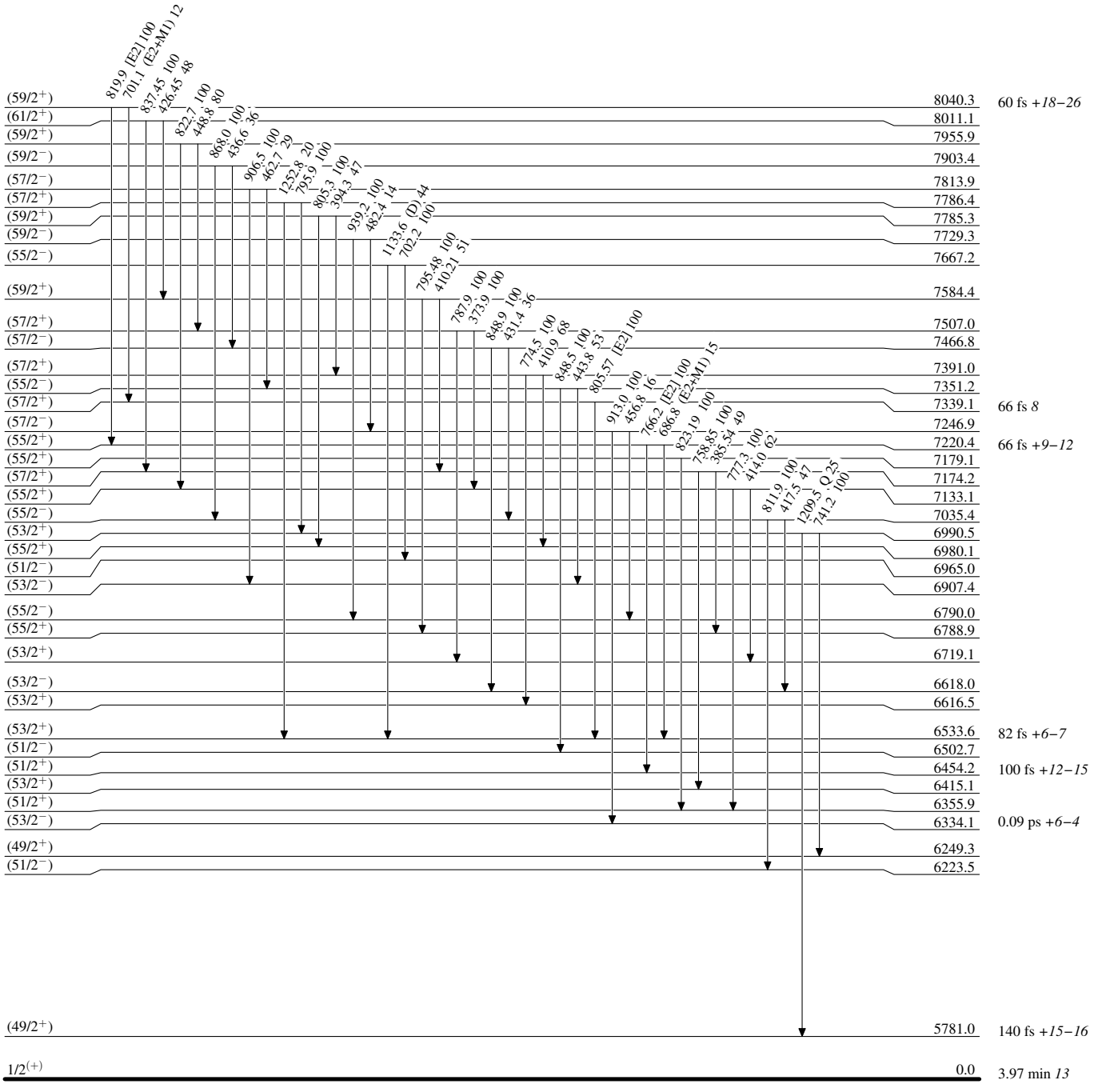


$^{163}_{71}Lu_{92}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

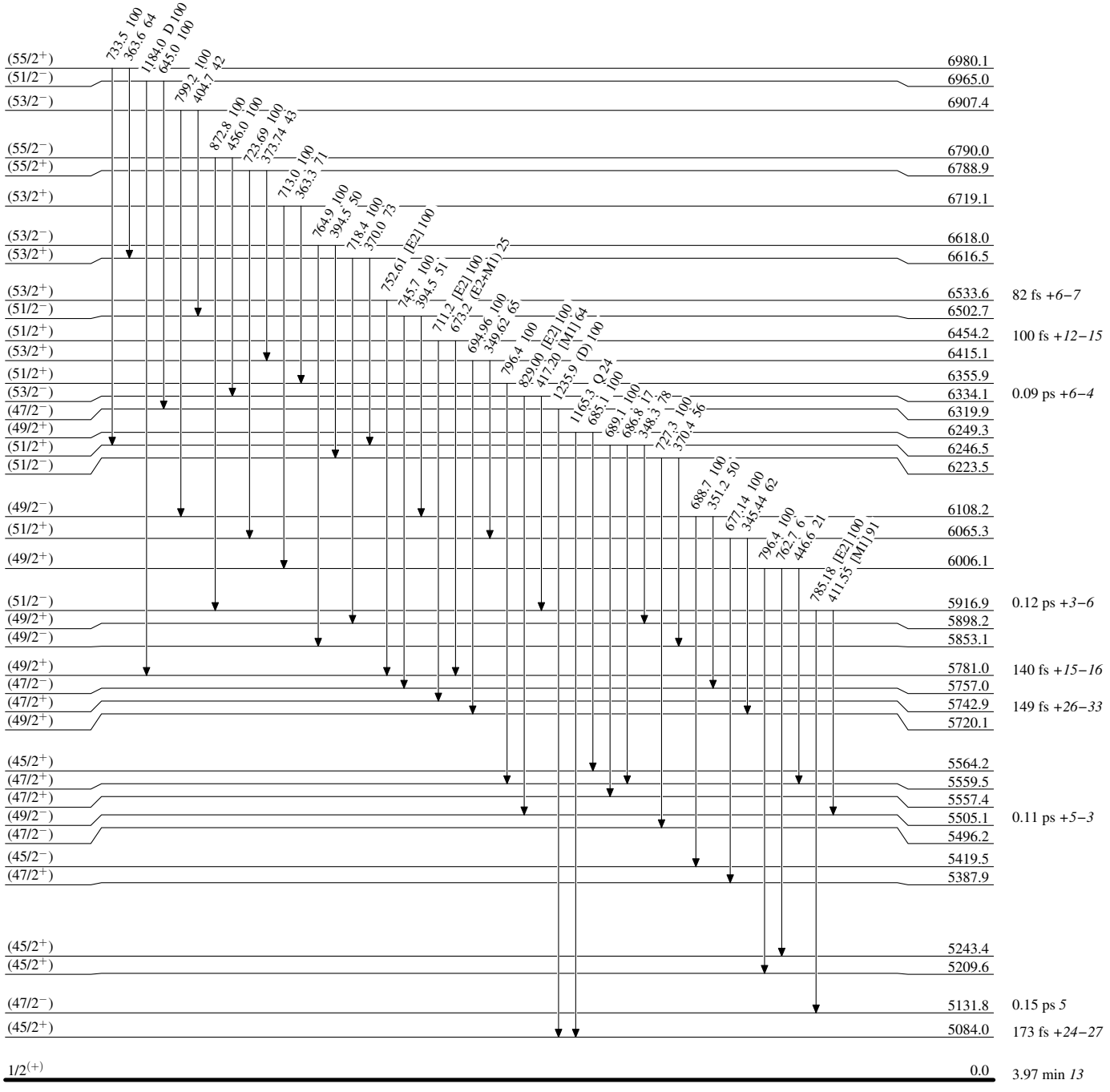


$^{163}_{71}Lu_{92}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

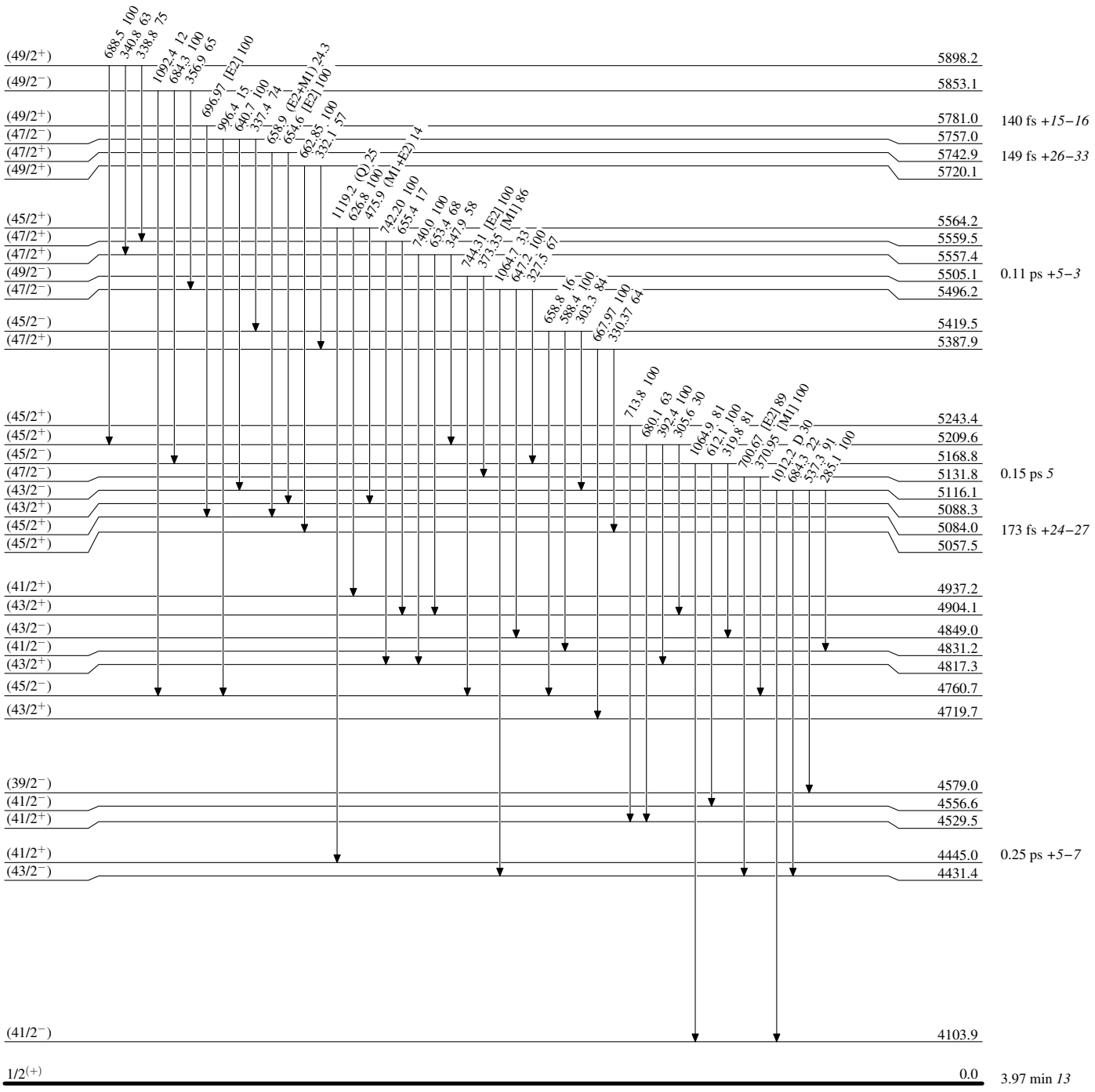


$^{163}_{71}Lu_{92}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

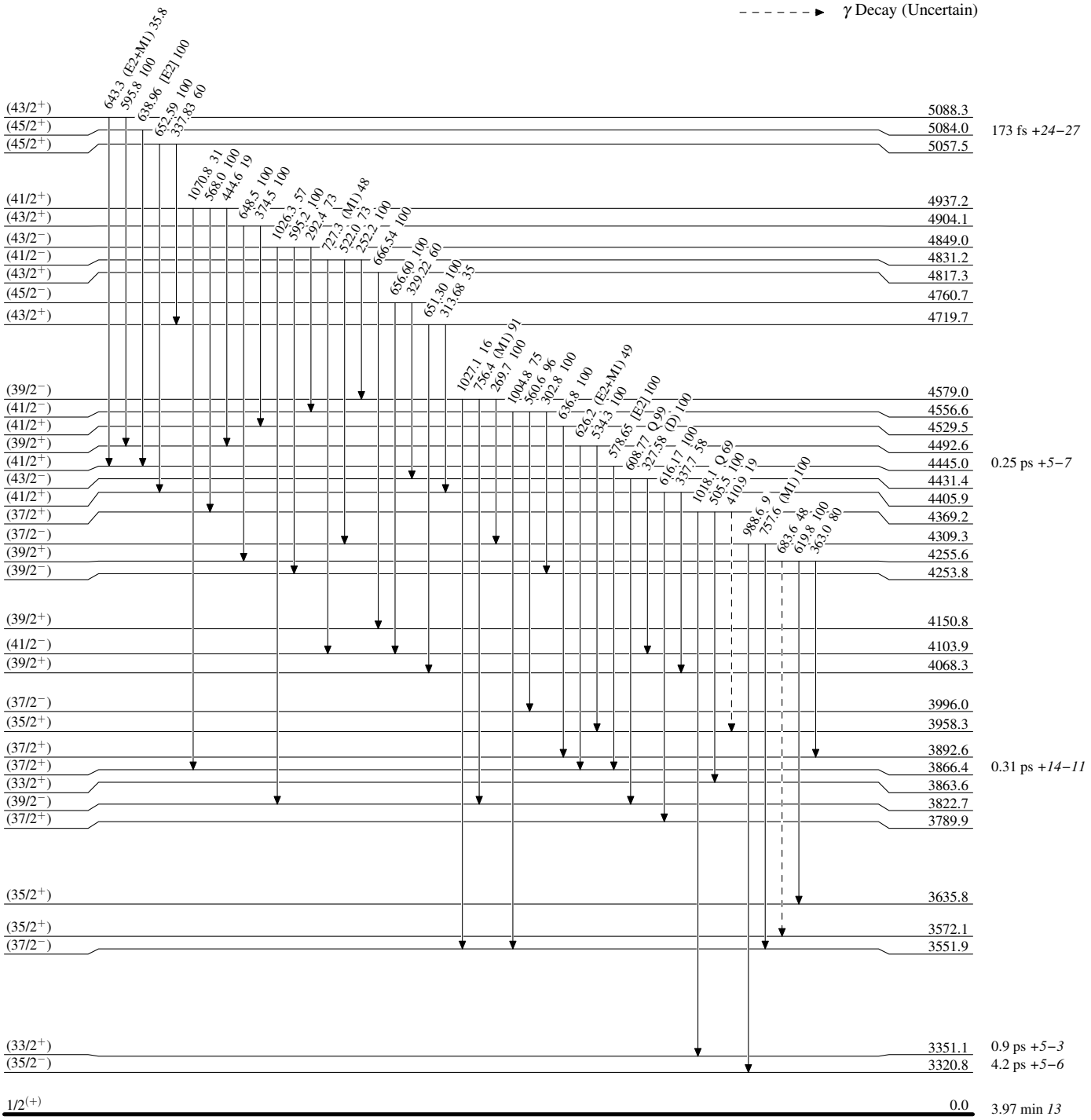


Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{163}_{71}Lu_{92}$

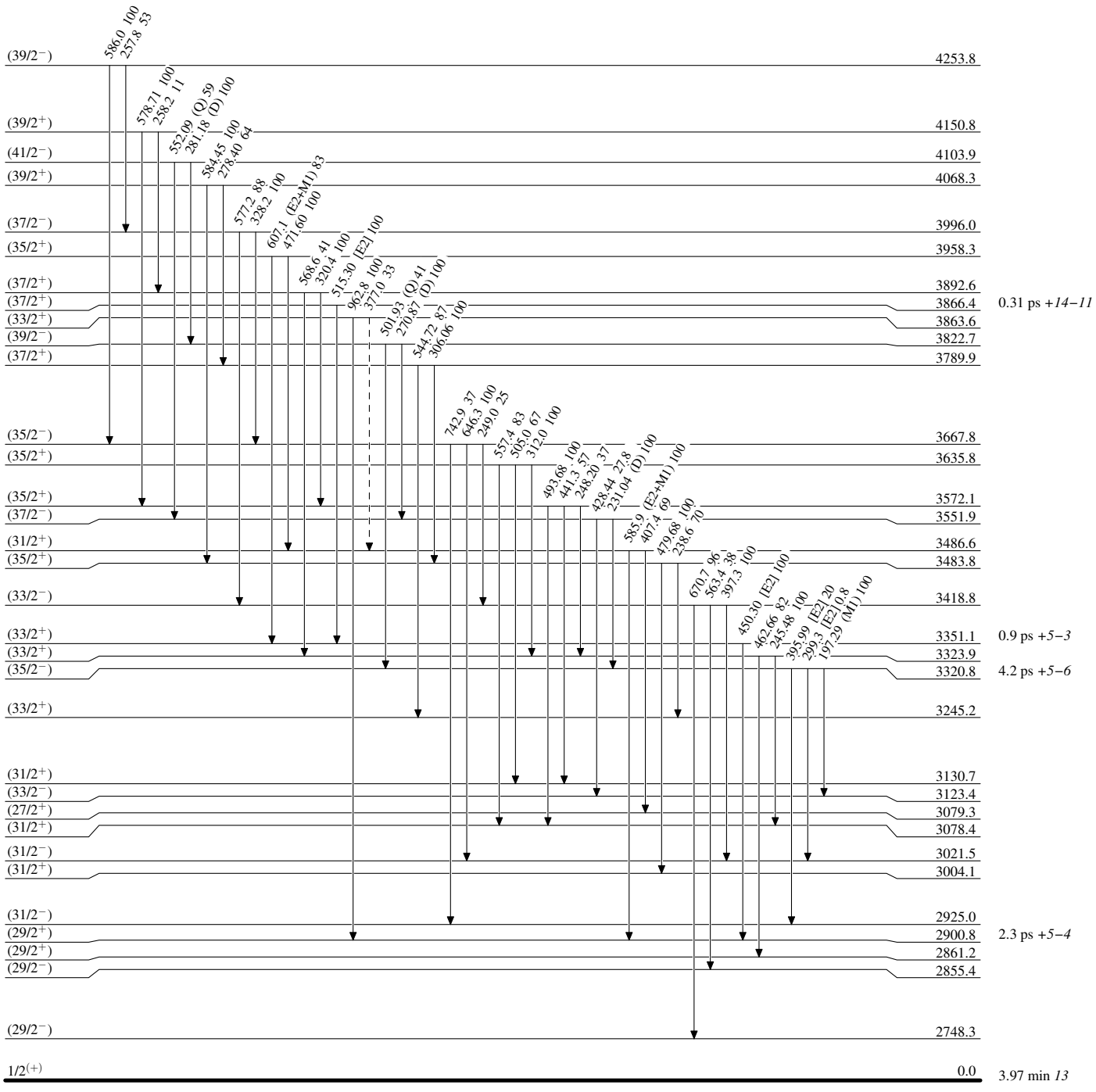
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

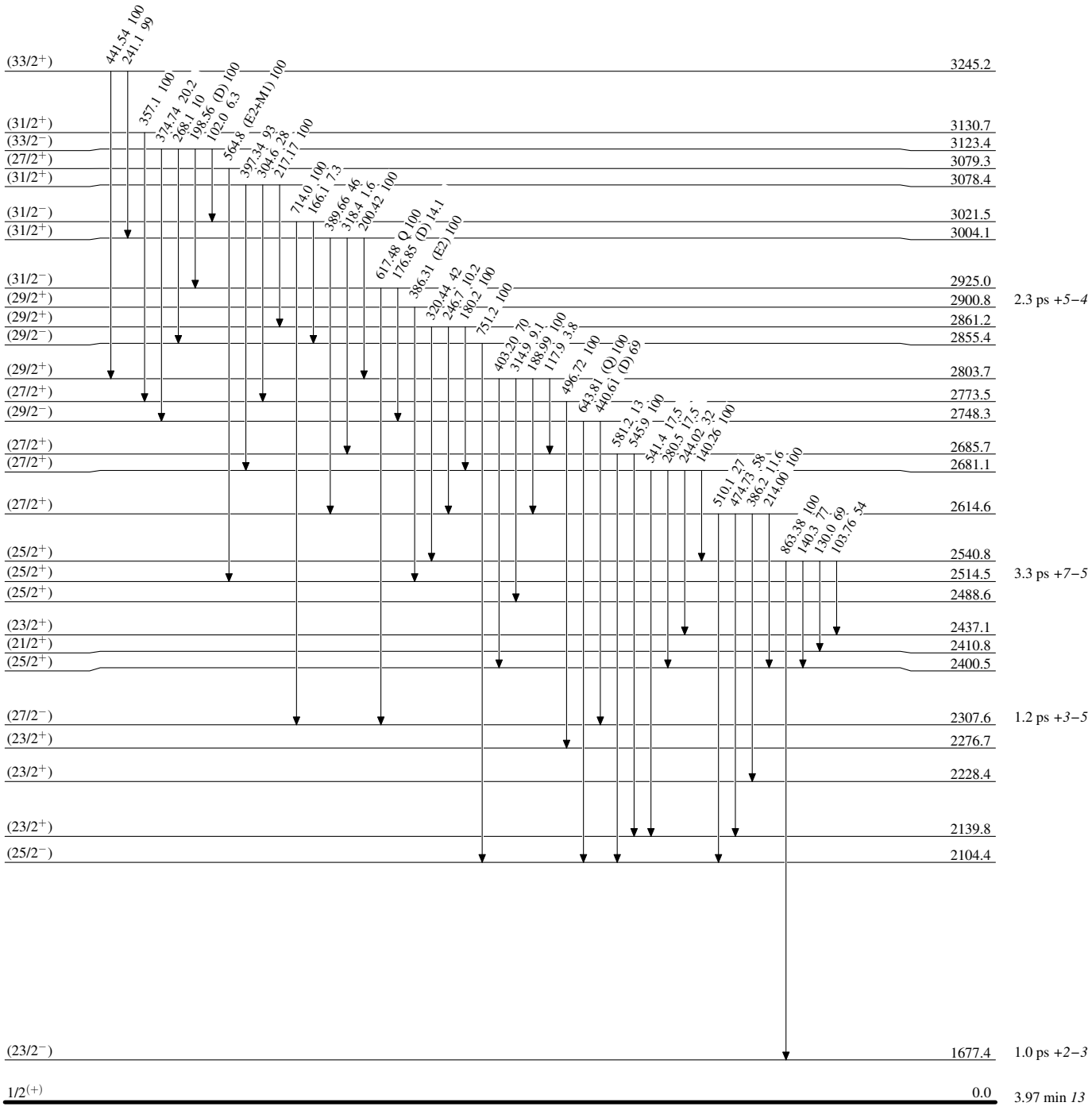


$^{163}_{71}Lu_{92}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{163}_{71}Lu_{92}$

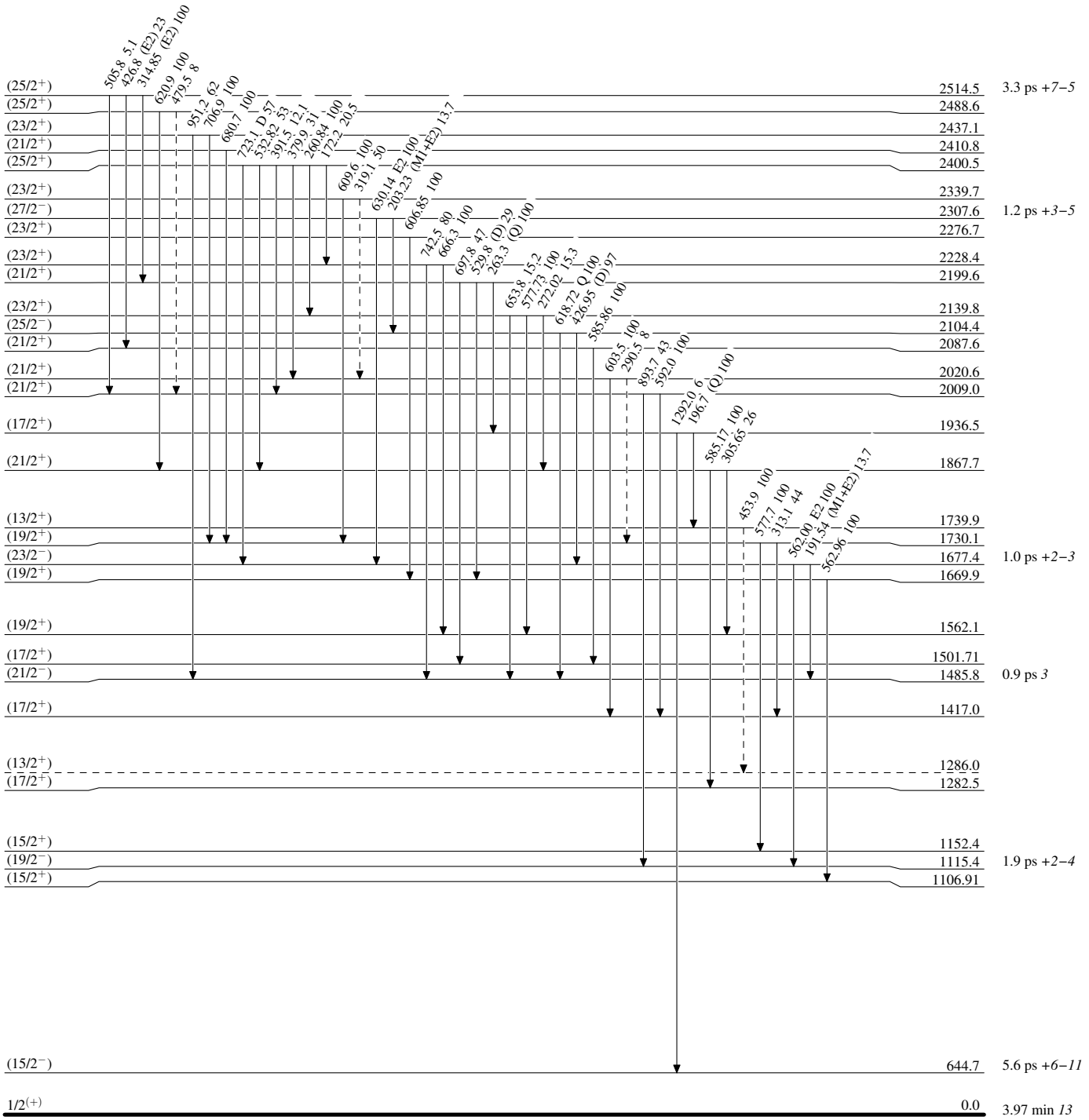
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{163}_{71}Lu_{92}$

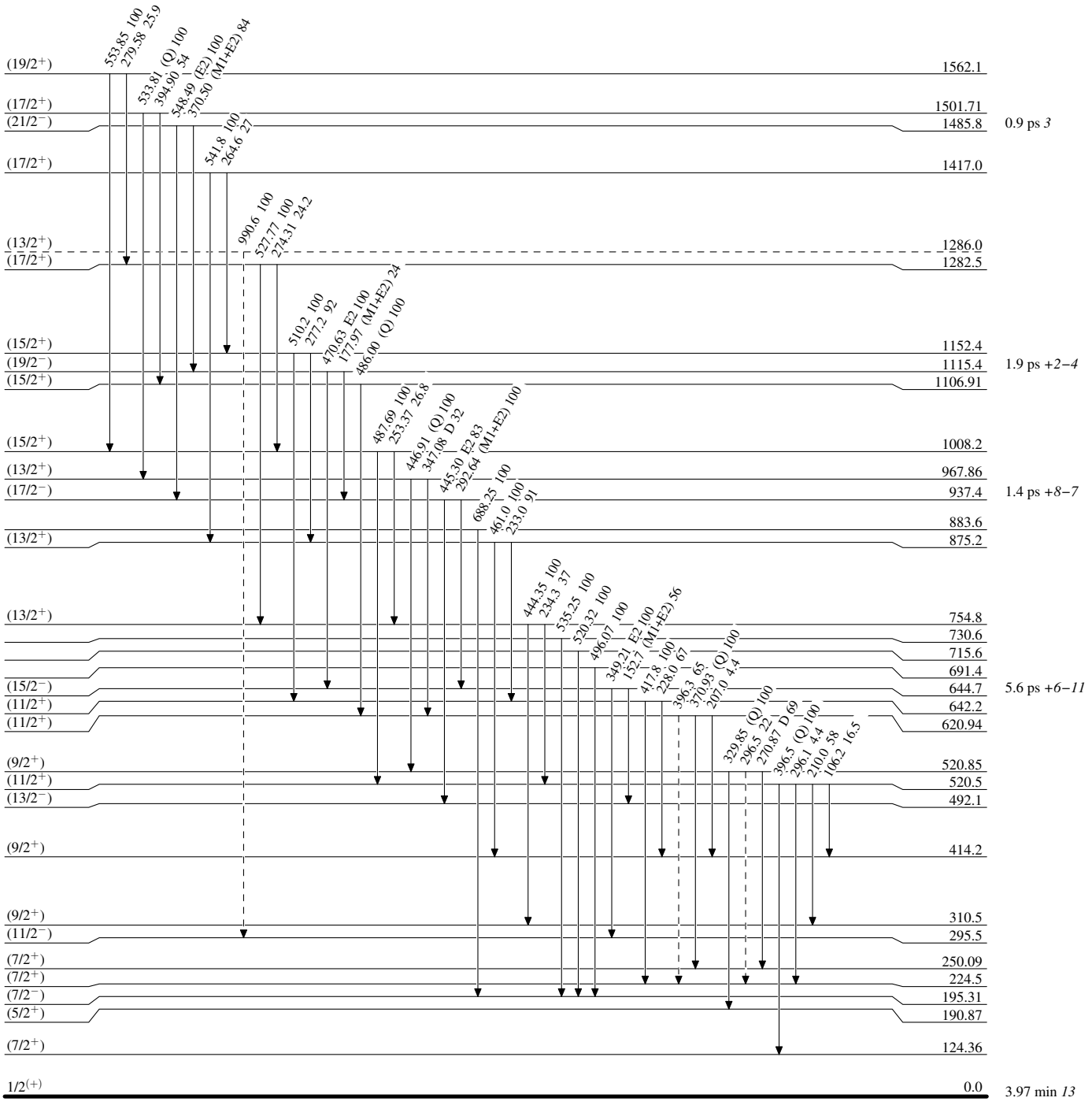
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{163}_{71}Lu_{92}$

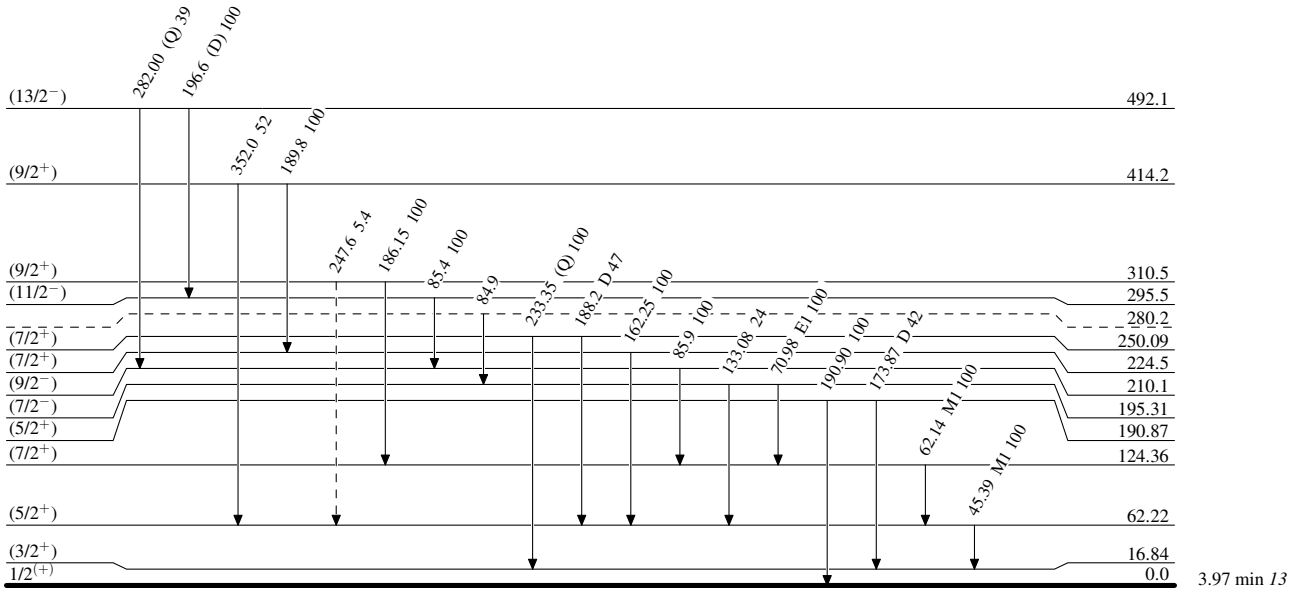
Adopted Levels, Gammas

Legend

Level Scheme (continued)

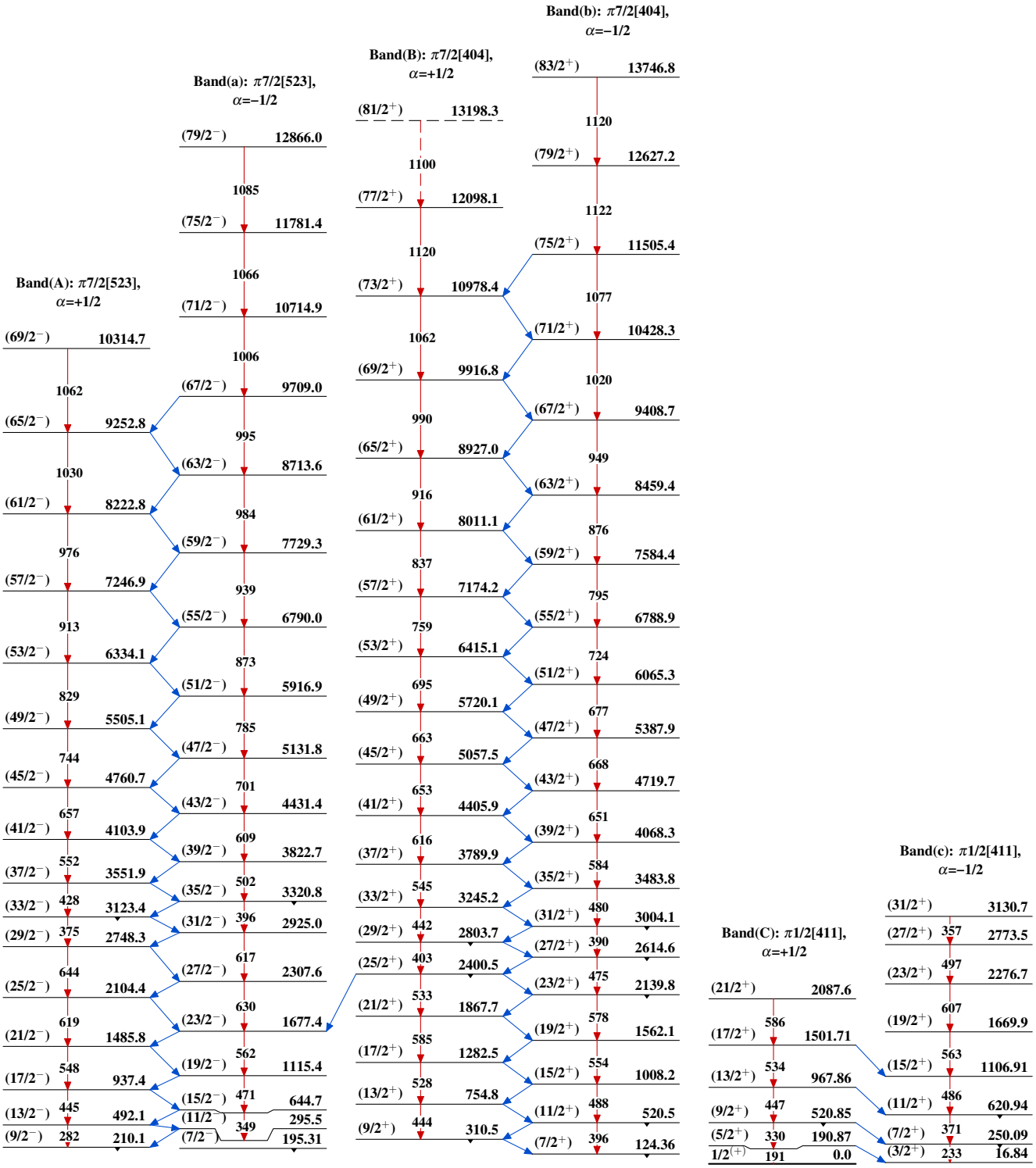
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



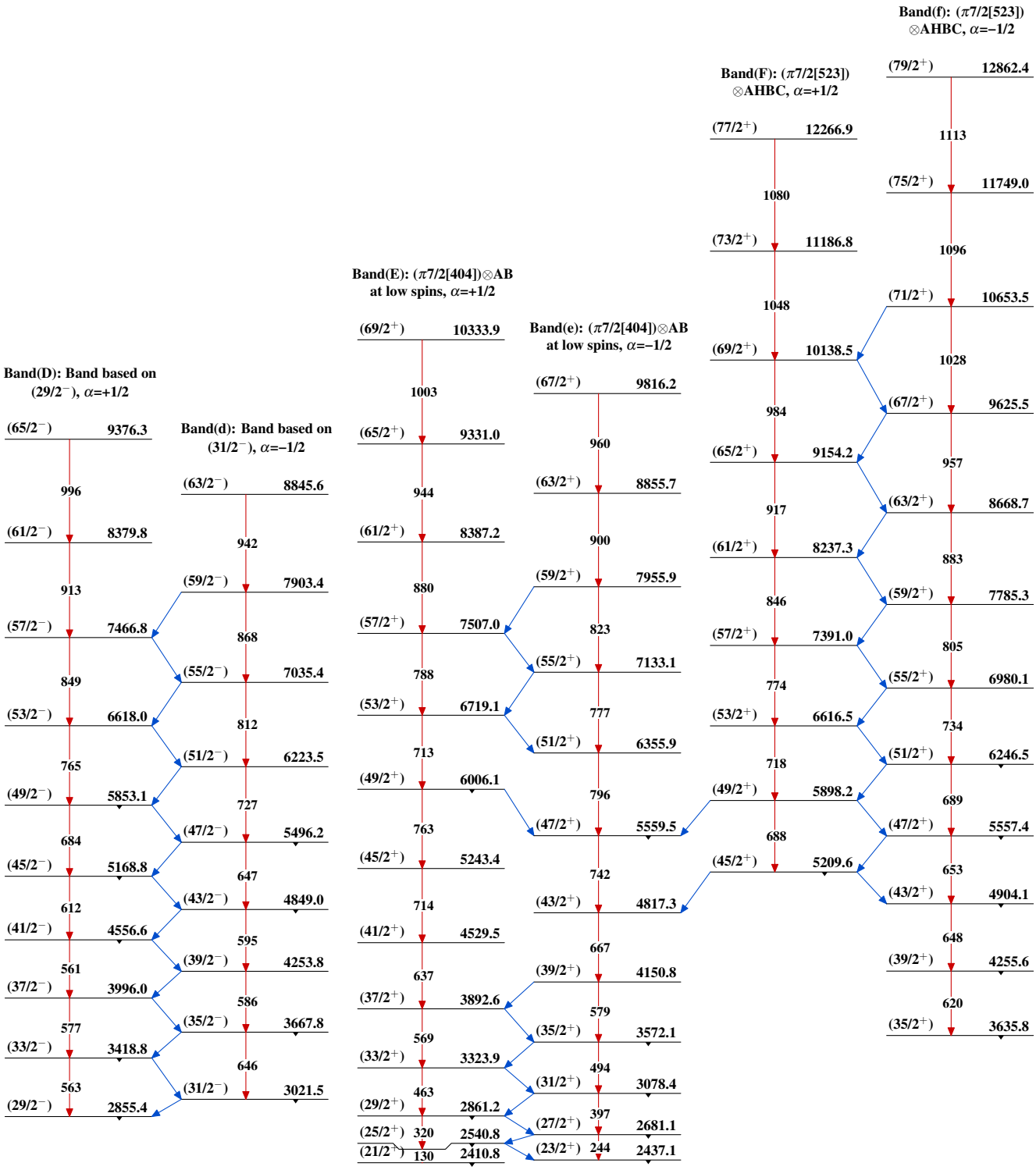
$^{163}_{71}Lu_{92}$

Adopted Levels, Gammas



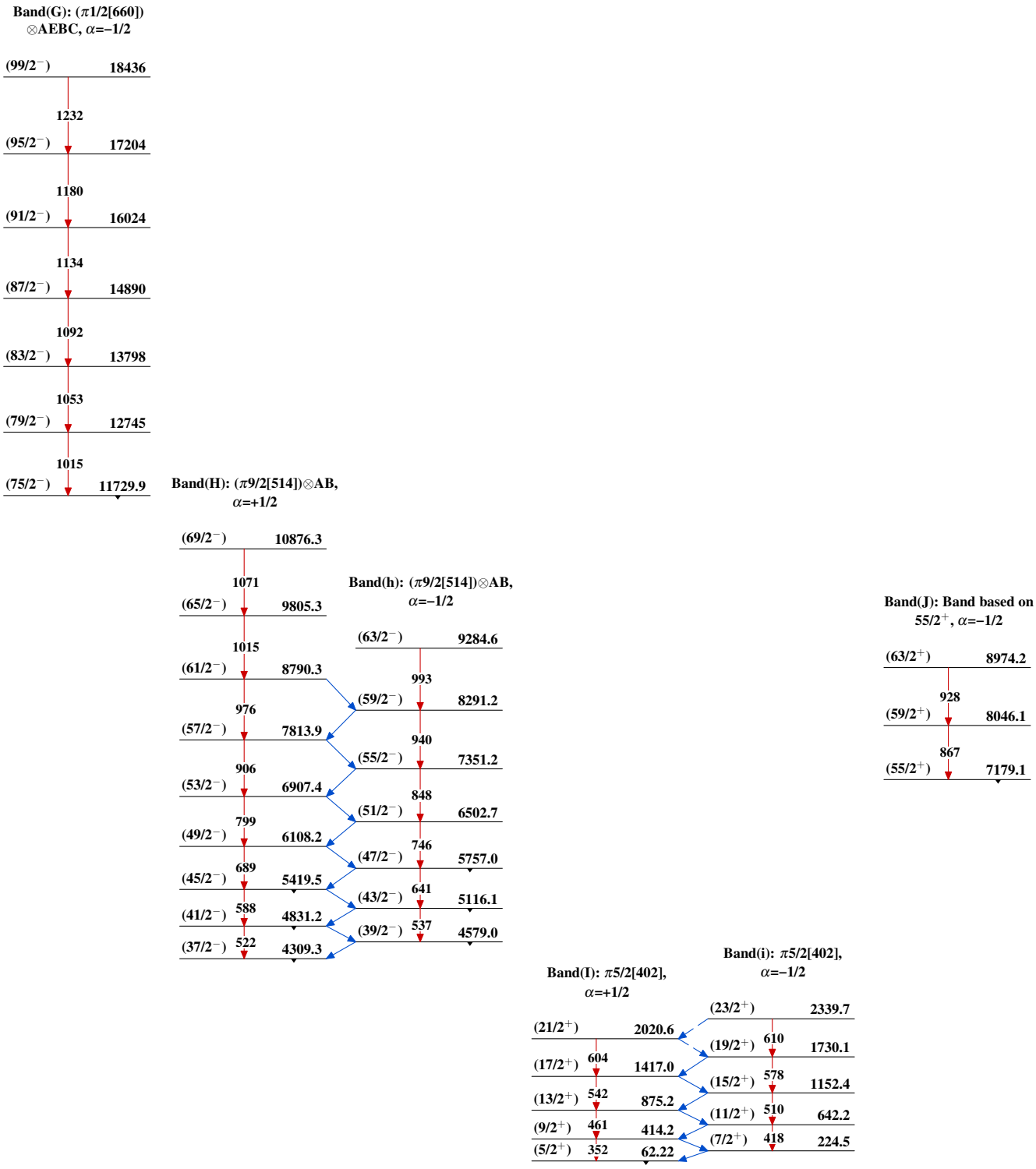
$^{163}_{71}Lu_{92}$

Adopted Levels, Gammas (continued)

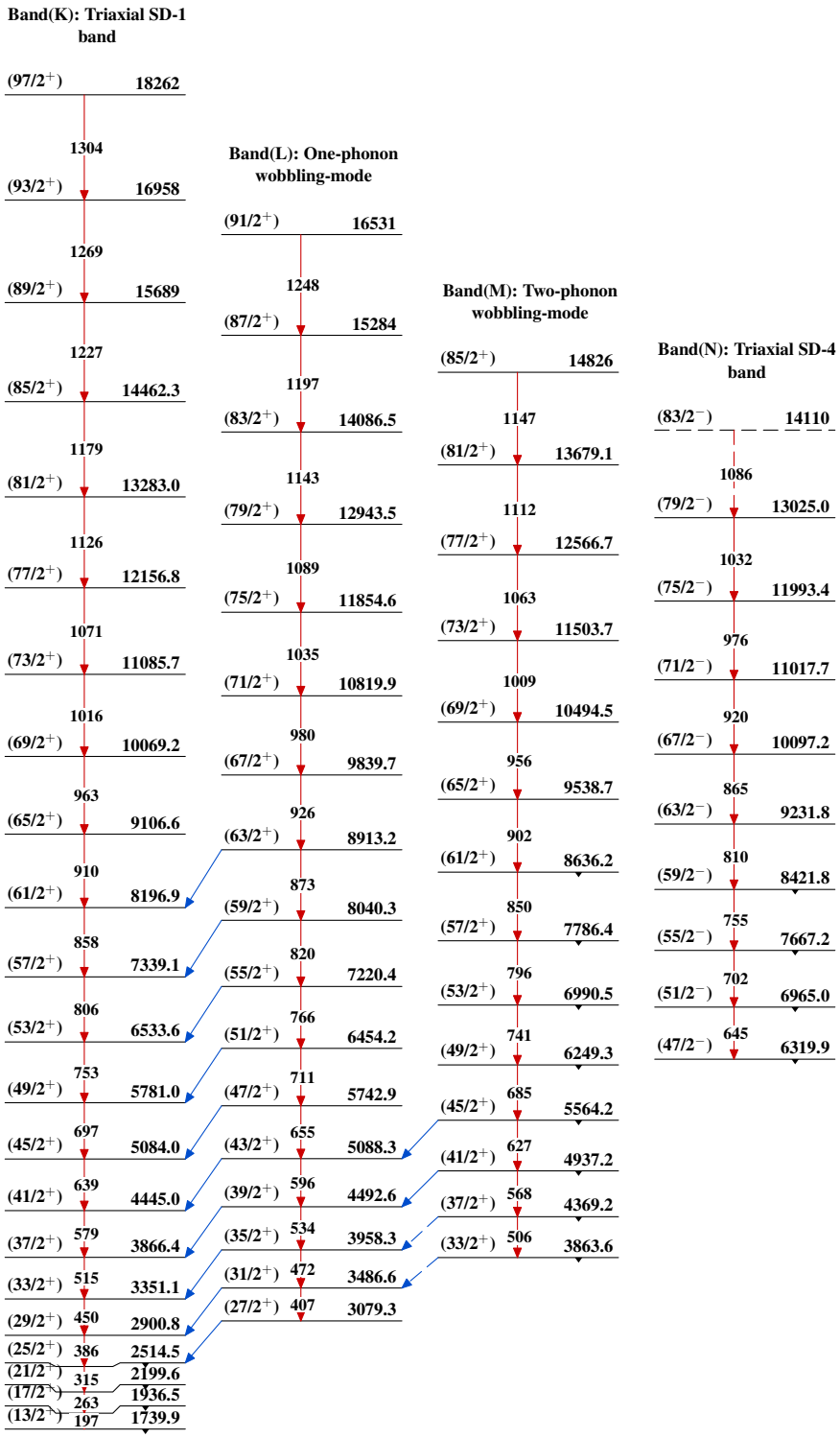


$^{163}_{71}Lu_{92}$

Adopted Levels, Gammas (continued)



Adopted Levels, Gammas (continued)



$^{163}_{71}Lu_{92}$