

¹³⁹La(18O,4nγ) 1998Ha37

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 170, 1 (2020)	16-Aug-2020

E=100 MeV. Measured Eγ, Iγ, γγ using an array with five HPGe detectors with BGO shields for Compton suppression. This data set is based on a data set compiled for the XUNDL database by Jordan Chenkin and B. Singh, McMaster University, July, 1999.

¹⁵³Tb Levels

E(level) [†]	Jπ [‡]	T _{1/2}	E(level) [†]	Jπ [‡]	E(level) [†]	Jπ [‡]
0.0 [#]	5/2 ⁺		2086.7	23/2 ⁽⁺⁾	3806.6 ^c	37/2 ⁻
80.7 ^d	7/2 ⁺		2095.2 ^c	25/2 ⁻	3957.3 ^a	37/2 ⁽⁺⁾
163.6 ^{bg}	11/2 ⁻	1738 μs	2096.0	19/2 ⁽⁺⁾	3995.1 ^e	37/2 ⁺
254.1 [@]	7/2 ⁺		2155.8 ^b	27/2 ⁻	4083.3 ^b	39/2 ⁻
263.2 ^c	9/2 ⁻		2210.9 ^e	25/2 ⁺	4110.7 ^f	39/2 ⁺
324.8 ^e	9/2 ⁺		2466.8 ^d	27/2 ⁺	4210 ^d	(39/2 ⁺)
444.6 [#]	9/2 ⁺		2534.0	27/2 ⁽⁺⁾	4268.2 ^{&}	39/2 ⁽⁺⁾
511.5 ^b	15/2 ⁻		2611.5 ^f	27/2 ⁺	4372.1 ^c	41/2 ⁻
529.3 ^d	11/2 ⁺		2614.2 ^{&}	23/2 ⁽⁺⁾	4601.0 ^a	41/2 ⁽⁺⁾
535.8 ^c	13/2 ⁻		2705.5 ^a	25/2 ⁽⁺⁾	4622 ^e	(41/2 ⁺)
630.6 [@]	11/2 ⁺		2740.4 ^c	29/2 ⁻	4695.2 ^b	43/2 ⁻
755.1 ^e	13/2 ⁺		2786.9 ^e	29/2 ⁺	4837.0 ^f	(43/2 ⁺)
848.4 [#]	13/2 ⁺		2827.5 ^b	31/2 ⁻	4955.9 ^{&}	43/2 ⁽⁺⁾
967.0 ^c	17/2 ⁻		2830.0 ^{&}	27/2 ⁽⁺⁾	5023.0 ^c	45/2 ⁻
967.7 ^d	15/2 ⁺		2951.9 ^f	31/2 ⁺	5330 ^a	(45/2 ⁺)
979.0 ^b	19/2 ⁻		2989.8 ^a	29/2 ⁽⁺⁾	5375.4 ^b	47/2 ⁻
1067.5 [@]	15/2 ⁺		3023.3 ^d	31/2 ⁺	5633.0 ^f	(47/2 ⁺)
1199.1 ^e	17/2 ⁺		3186.0 ^{&}	31/2 ⁽⁺⁾	5722 [?] ^{&}	(47/2 ⁺)
1422.2 ^d	19/2 ⁺		3320.3 ^c	33/2 ⁻	5756.7 ^c	(49/2 ⁻)
1474.5	19/2 ⁽⁻⁾		3392.3 ^e	33/2 ⁺	6127.8 ^b	(51/2 ⁻)
1495.1 ^c	21/2 ⁻		3413.6 ^a	33/2 ⁽⁺⁾	6486 [?] ^f	(51/2 ⁺)
1532.9 ^b	23/2 ⁻		3472.0 ^f	35/2 ⁺	6565.9 ^c	(53/2 ⁻)
1681.2 ^e	21/2 ⁺		3494.1 ^b	35/2 ⁻	6947 [?] ^b	(55/2 ⁻)
1923.4 ^d	23/2 ⁺		3608.1 ^d	(35/2 ⁺)	7447 ^c	(57/2 ⁻)
2019.7	21/2 ⁽⁺⁾		3672.0 ^{&}	35/2 ⁽⁺⁾		

[†] From unweighted least-squares fit to Eγ's.

[‡] As assigned by 1998Ha37, most are the same as in 'Adopted Levels', with the exception of several of the adopted assignments are placed in parentheses.

[#] Band(A): 5/2[402] band, α=+1/2.

[@] Band(a): 5/2[402] band, α=-1/2.

[&] Band(B): πh_{11/2}ν(i_{13/2}h_{11/2}), α=-1/2. In quasiparticle labeling, configuration=A_p⊗AX(Y) (B_p⊗AX(Y) not ruled out) (1998Ha37). A_p=πh_{11/2}, α=-1/2, A=νi_{13/2}, α=+1/2, B_p=πh_{11/2}, α=+1/2, X=νh_{11/2}, α=+1/2, Y=νh_{11/2}, α=-1/2.

^a Band(b): πh_{11/2}ν(i_{13/2}h_{11/2}), α=+1/2. In quasiparticle labeling, configuration=A_p⊗AX(Y) (B_p⊗AX(Y) not ruled out) (1998Ha37). A_p=πh_{11/2}, α=-1/2, A=νi_{13/2}, α=+1/2, B_p=πh_{11/2}, α=+1/2, X=νh_{11/2}, α=+1/2, Y=νh_{11/2}, α=-1/2.

^b Band(C): πh_{11/2} band, α=-1/2.

^c Band(c): πh_{11/2} band, α=+1/2.

^d Band(D): 7/2[404] band, α=-1/2.

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¹³⁹La(¹⁸O,4nγ) **1998Ha37** (continued)

¹⁵³Tb Levels (continued)

^e Band(d): 7/2[404] band, α=+1/2.

^f Band(E): α=-1/2 band. Major component of configuration=πh_{11/2}ν(i_{13/2}2f_{7/2}), or in quasiparticle labeling: A_p⊗AF (B_pAE not ruled out), where A_p=πh_{11/2},α=-1/2, B_p=πh_{11/2},α=+1/2, A=νi_{13/2},α=+1/2, E=νf_{7/2},α=+1/2, F=νf_{7/2},α=-1/2.

^g Quoted in **1998Ha37** as from **1977De05**.

						<u>γ(¹⁵³Tb)</u>												
<u>E_γ</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	<u>E_γ</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	<u>E_γ</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	
80.7	80.7	7/2 ⁺	0.0	5/2 ⁺		376.4	630.6	11/2 ⁺	254.1	7/2 ⁺								
82.6	163.6	11/2 ⁻	80.7	7/2 ⁺	M2 [†]	381	5756.7	(49/2 ⁻)	5375.4	47/2 ⁻								
99.6	263.2	9/2 ⁻	163.6	11/2 ⁻		404.0	848.4	13/2 ⁺	444.6	9/2 ⁺								
124	2830.0	27/2 ⁽⁺⁾	2705.5	25/2 ⁽⁺⁾		417.8	2951.9	31/2 ⁺	2534.0	27/2 ⁽⁺⁾								
161	2989.8	29/2 ⁽⁺⁾	2830.0	27/2 ⁽⁺⁾		423.7	3413.6	33/2 ⁽⁺⁾	2989.8	29/2 ⁽⁺⁾								
173.9	3494.1	35/2 ⁻	3320.3	33/2 ⁻		430.4	755.1	13/2 ⁺	324.8	9/2 ⁺								
186.0	630.6	11/2 ⁺	444.6	9/2 ⁺		431.4	967.0	17/2 ⁻	535.8	13/2 ⁻								
190.5	444.6	9/2 ⁺	254.1	7/2 ⁺		436.7	1067.5	15/2 ⁺	630.6	11/2 ⁺								
196	3186.0	31/2 ⁽⁺⁾	2989.8	29/2 ⁽⁺⁾		438.6	967.7	15/2 ⁺	529.3	11/2 ⁺								
204.5	529.3	11/2 ⁺	324.8	9/2 ⁺		444.0	1199.1	17/2 ⁺	755.1	13/2 ⁺								
211.7	2951.9	31/2 ⁺	2740.4	29/2 ⁻	D [‡]	444.5	444.6	9/2 ⁺	0.0	5/2 ⁺								
212.6	967.7	15/2 ⁺	755.1	13/2 ⁺		448.7	529.3	11/2 ⁺	80.7	7/2 ⁺								
216.0	2830.0	27/2 ⁽⁺⁾	2614.2	23/2 ⁽⁺⁾		454.5	1422.2	19/2 ⁺	967.7	15/2 ⁺								
218	848.4	13/2 ⁺	630.6	11/2 ⁺		455.4	967.0	17/2 ⁻	511.5	15/2 ⁻								
219	1067.5	15/2 ⁺	848.4	13/2 ⁺		467.6	979.0	19/2 ⁻	511.5	15/2 ⁻								
223.2	1422.2	19/2 ⁺	1199.1	17/2 ⁺		482.2	1681.2	21/2 ⁺	1199.1	17/2 ⁺								
225.9	755.1	13/2 ⁺	529.3	11/2 ⁺		485.0	2951.9	31/2 ⁺	2466.8	27/2 ⁺	E2 [#]							
228	3413.6	33/2 ⁽⁺⁾	3186.0	31/2 ⁽⁺⁾		486.1	3672.0	35/2 ⁽⁺⁾	3186.0	31/2 ⁽⁺⁾								
231.2	1199.1	17/2 ⁺	967.7	15/2 ⁺		486.2	3806.6	37/2 ⁻	3320.3	33/2 ⁻								
236	3023.3	31/2 ⁺	2786.9	29/2 ⁺		492.9	3320.3	33/2 ⁻	2827.5	31/2 ⁻								
241.9	1923.4	23/2 ⁺	1681.2	21/2 ⁺		501.2	1923.4	23/2 ⁺	1422.2	19/2 ⁺								
244.2	324.8	9/2 ⁺	80.7	7/2 ⁺		516.2	1495.1	21/2 ⁻	979.0	19/2 ⁻								
254.1	254.1	7/2 ⁺	0.0	5/2 ⁺		516.4	2611.5	27/2 ⁺	2095.2	25/2 ⁻	D [@]							
255.9	2466.8	27/2 ⁺	2210.9	25/2 ⁺		520.1	3472.0	35/2 ⁺	2951.9	31/2 ⁺								
258	3672.0	35/2 ⁽⁺⁾	3413.6	33/2 ⁽⁺⁾		524.7	2611.5	27/2 ⁺	2086.7	23/2 ⁽⁺⁾								
258.8	1681.2	21/2 ⁺	1422.2	19/2 ⁺		528.1	1495.1	21/2 ⁻	967.0	17/2 ⁻								
272.5	535.8	13/2 ⁻	263.2	9/2 ⁻		529	2614.2	23/2 ⁽⁺⁾	2086.7	23/2 ⁽⁺⁾								
276.6	4083.3	39/2 ⁻	3806.6	37/2 ⁻		529.7	2210.9	25/2 ⁺	1681.2	21/2 ⁺								
284.3	2989.8	29/2 ⁽⁺⁾	2705.5	25/2 ⁽⁺⁾		543.4	2466.8	27/2 ⁺	1923.4	23/2 ⁺								
287.3	2210.9	25/2 ⁺	1923.4	23/2 ⁺		543.7	3957.3	37/2 ⁽⁺⁾	3413.6	33/2 ⁽⁺⁾								
288.9	4372.1	41/2 ⁻	4083.3	39/2 ⁻		545.2	2019.7	21/2 ⁽⁺⁾	1474.5	19/2 ⁽⁻⁾								
310.5	755.1	13/2 ⁺	444.6	9/2 ⁺		553.9	1532.9	23/2 ⁻	979.0	19/2 ⁻								
312.5	3806.6	37/2 ⁻	3494.1	35/2 ⁻		556.5	3023.3	31/2 ⁺	2466.8	27/2 ⁺								
320	2786.9	29/2 ⁺	2466.8	27/2 ⁺		562.4	2095.2	25/2 ⁻	1532.9	23/2 ⁻								
323.0	4695.2	43/2 ⁻	4372.1	41/2 ⁻		565.5	4372.1	41/2 ⁻	3806.6	37/2 ⁻								
324.9	324.8	9/2 ⁺	0.0	5/2 ⁺		576.0	2786.9	29/2 ⁺	2210.9	25/2 ⁺								
327.9	5023.0	45/2 ⁻	4695.2	43/2 ⁻		579.8	3320.3	33/2 ⁻	2740.4	29/2 ⁻								
337.2	967.7	15/2 ⁺	630.6	11/2 ⁺		584.6	2740.4	29/2 ⁻	2155.8	27/2 ⁻								
340.5	2951.9	31/2 ⁺	2611.5	27/2 ⁺		584.8	3608.1	(35/2 ⁺)	3023.3	31/2 ⁺								
348.0	511.5	15/2 ⁻	163.6	11/2 ⁻		589.3	4083.3	39/2 ⁻	3494.1	35/2 ⁻								
350.8	1199.1	17/2 ⁺	848.4	13/2 ⁺		591.8	2086.7	23/2 ⁽⁺⁾	1495.1	21/2 ⁻								
352.5	5375.4	47/2 ⁻	5023.0	45/2 ⁻		596.2	4268.2	39/2 ⁽⁺⁾	3672.0	35/2 ⁽⁺⁾								
354.4	1422.2	19/2 ⁺	1067.5	15/2 ⁺		600.2	2095.2	25/2 ⁻	1495.1	21/2 ⁻								
356.2	3186.0	31/2 ⁽⁺⁾	2830.0	27/2 ⁽⁺⁾		602 ^a	4210?	(39/2 ⁺)	3608.1	(35/2 ⁺)								
371	6127.8	(51/2 ⁻)	5756.7	(49/2 ⁻)		602.8	3995.1	37/2 ⁺	3392.3	33/2 ⁺								
372.1	535.8	13/2 ⁻	163.6	11/2 ⁻		605.4	3392.3	33/2 ⁺	2786.9	29/2 ⁺								

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$^{139}\text{La}(^{18}\text{O},4n\gamma)$ **1998Ha37** (continued) $\gamma(^{153}\text{Tb})$ (continued)

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.
610.5	2534.0	27/2 ⁽⁺⁾	1923.4	23/2 ⁺		726.3	4837.0	(43/2 ⁺)	4110.7	39/2 ⁺	
611.9	4695.2	43/2 ⁻	4083.3	39/2 ⁻		729	5330	(45/2 ⁺)	4601.0	41/2 ⁽⁺⁾	
622.8	2155.8	27/2 ⁻	1532.9	23/2 ⁻		733.7	5756.7	(49/2 ⁻)	5023.0	45/2 ⁻	
627 ^a	4622?	(41/2 ⁺)	3995.1	37/2 ⁺		752.4	6127.8	(51/2 ⁻)	5375.4	47/2 ⁻	
638.7	4110.7	39/2 ⁺	3472.0	35/2 ⁺		766 ^a	5722?	(47/2 ⁺)	4955.9	43/2 ⁽⁺⁾	
643.7	4601.0	41/2 ⁽⁺⁾	3957.3	37/2 ⁽⁺⁾		796.0	5633.0	(47/2 ⁺)	4837.0	(43/2 ⁺)	
645.2	2740.4	29/2 ⁻	2095.2	25/2 ⁻		809.2	6565.9	(53/2 ⁻)	5756.7	(49/2 ⁻)	
651.0	5023.0	45/2 ⁻	4372.1	41/2 ⁻		819 ^a	6947?	(55/2 ⁻)	6127.8	(51/2 ⁻)	
666.6	3494.1	35/2 ⁻	2827.5	31/2 ⁻		853 ^a	6486?	(51/2 ⁺)	5633.0	(47/2 ⁺)	
671.6	2827.5	31/2 ⁻	2155.8	27/2 ⁻		881	7447	(57/2 ⁻)	6565.9	(53/2 ⁻)	
680.0	5375.4	47/2 ⁻	4695.2	43/2 ⁻		963.0	1474.5	19/2 ⁽⁻⁾	511.5	15/2 ⁻	
685.8	2705.5	25/2 ⁽⁺⁾	2019.7	21/2 ⁽⁺⁾		1117	2096.0	19/2 ⁽⁺⁾	979.0	19/2 ⁻	
687.7	4955.9	43/2 ⁽⁺⁾	4268.2	39/2 ⁽⁺⁾		1172.6	2705.5	25/2 ⁽⁺⁾	1532.9	23/2 ⁻	D&
688.0	2611.5	27/2 ⁺	1923.4	23/2 ⁺	E2 [#]						

[†] Quoted in 1998Ha37 as from 1977De05.

[‡] From DCO=0.7 *I*.

[#] From DCO=1.1 *I* which implies a quadrupole transition.

[@] From DCO=0.6 *I*.

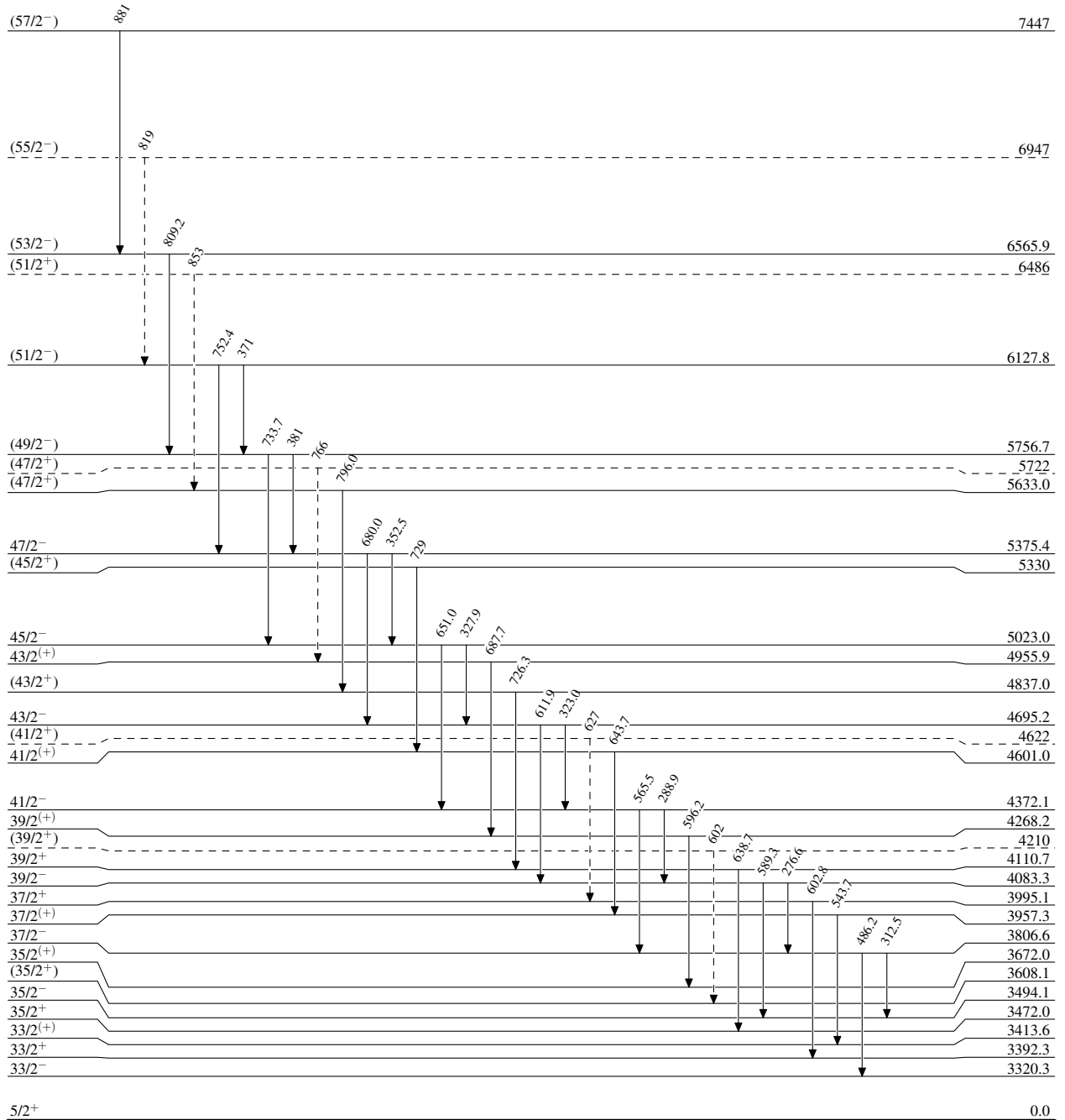
[&] From DCO=0.5 *I*.

^a Placement of transition in the level scheme is uncertain.

$^{139}\text{La}(^{18}\text{O},4n\gamma)$ 1998Ha37

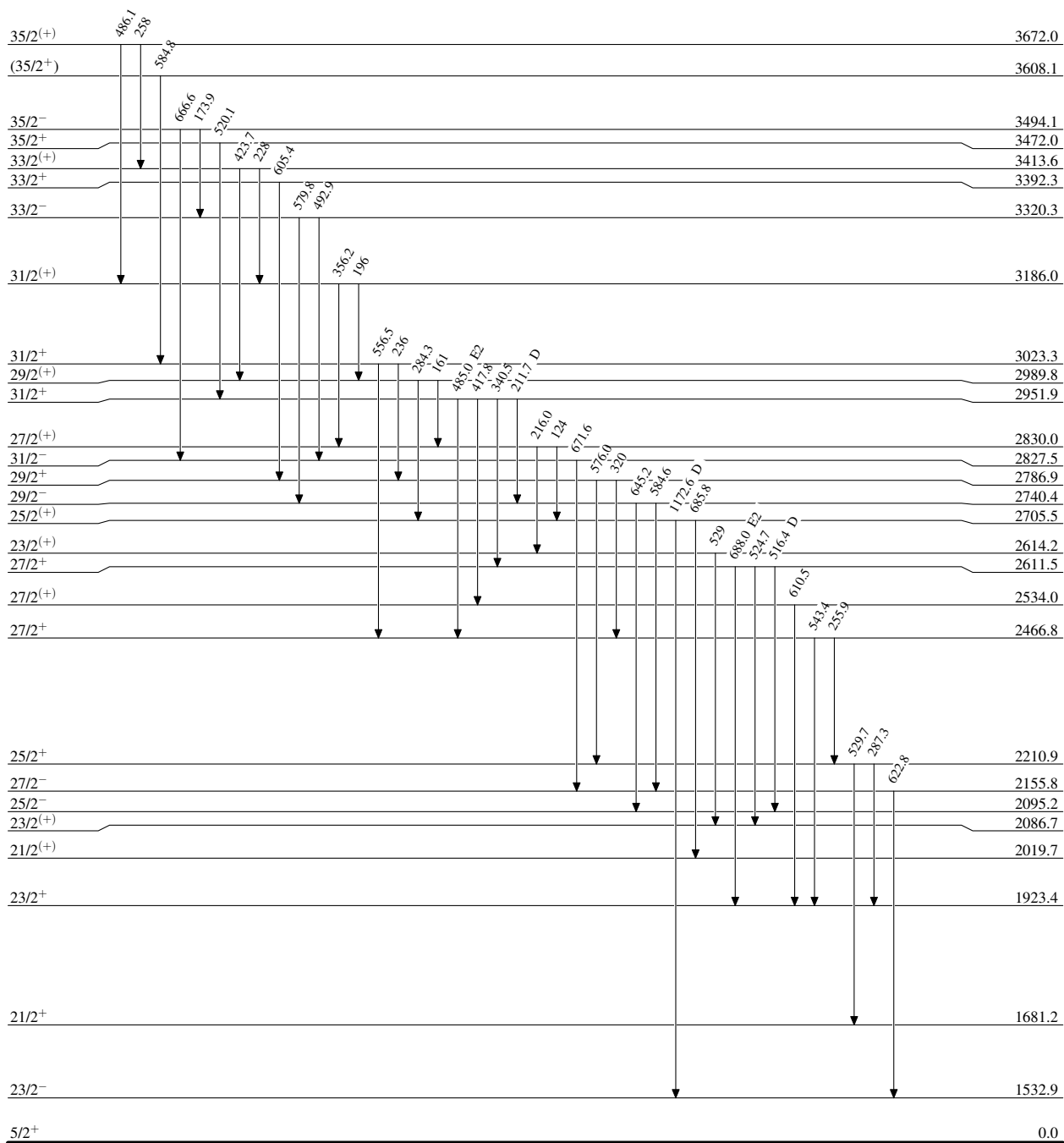
Legend

Level Scheme

-----► γ Decay (Uncertain) $^{153}_{65}\text{Tb}_{88}$

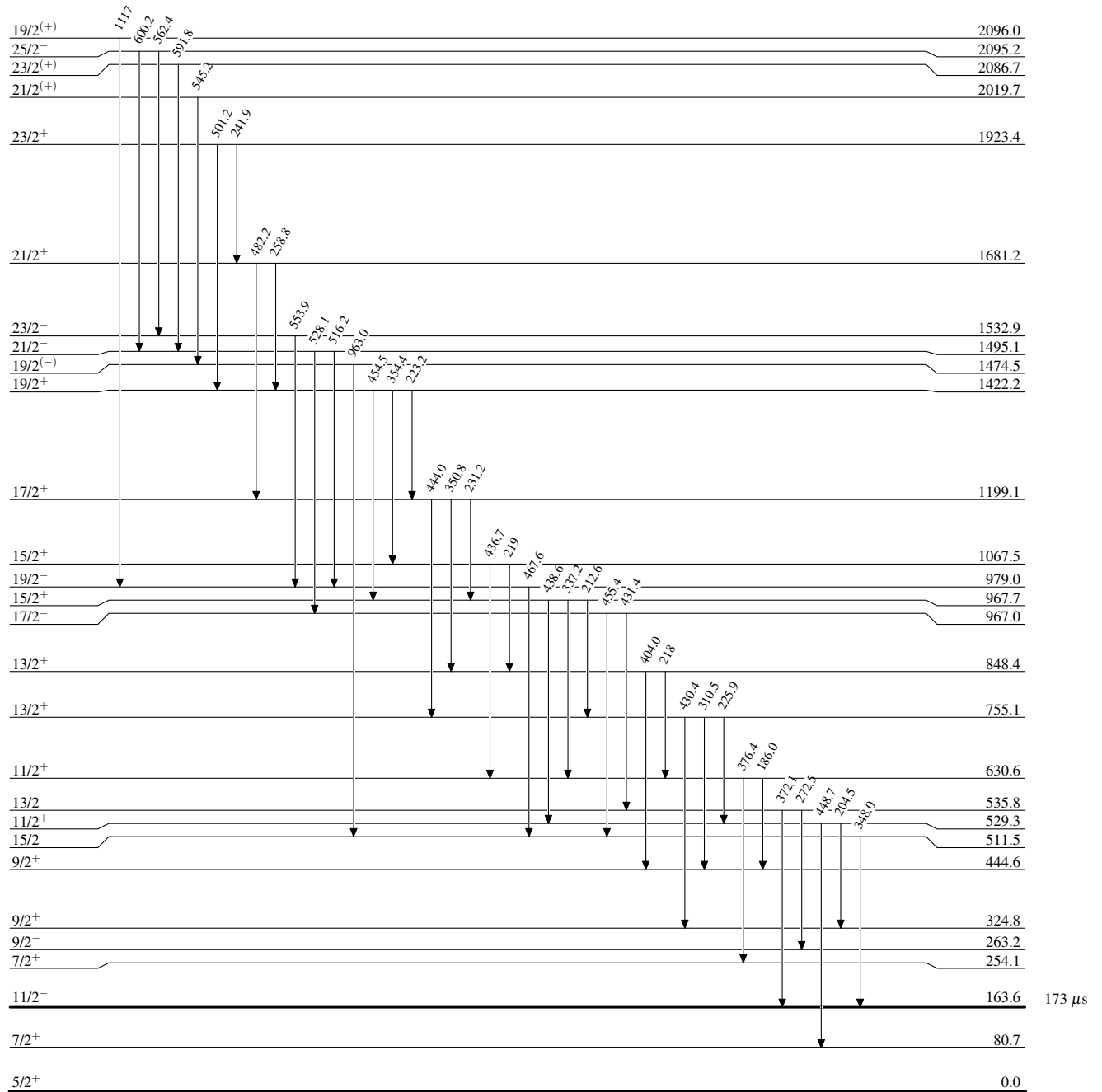
$^{139}\text{La}(^{18}\text{O},4n\gamma)$ 1998Ha37

Level Scheme (continued)



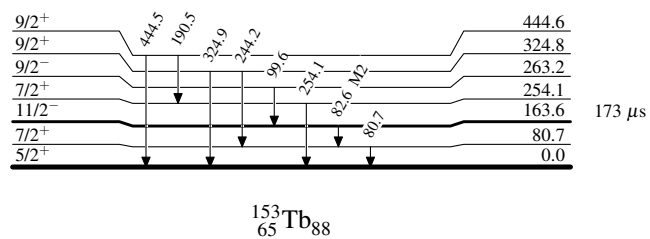
$^{139}\text{La}(^{18}\text{O},4n\gamma)$ 1998Ha37

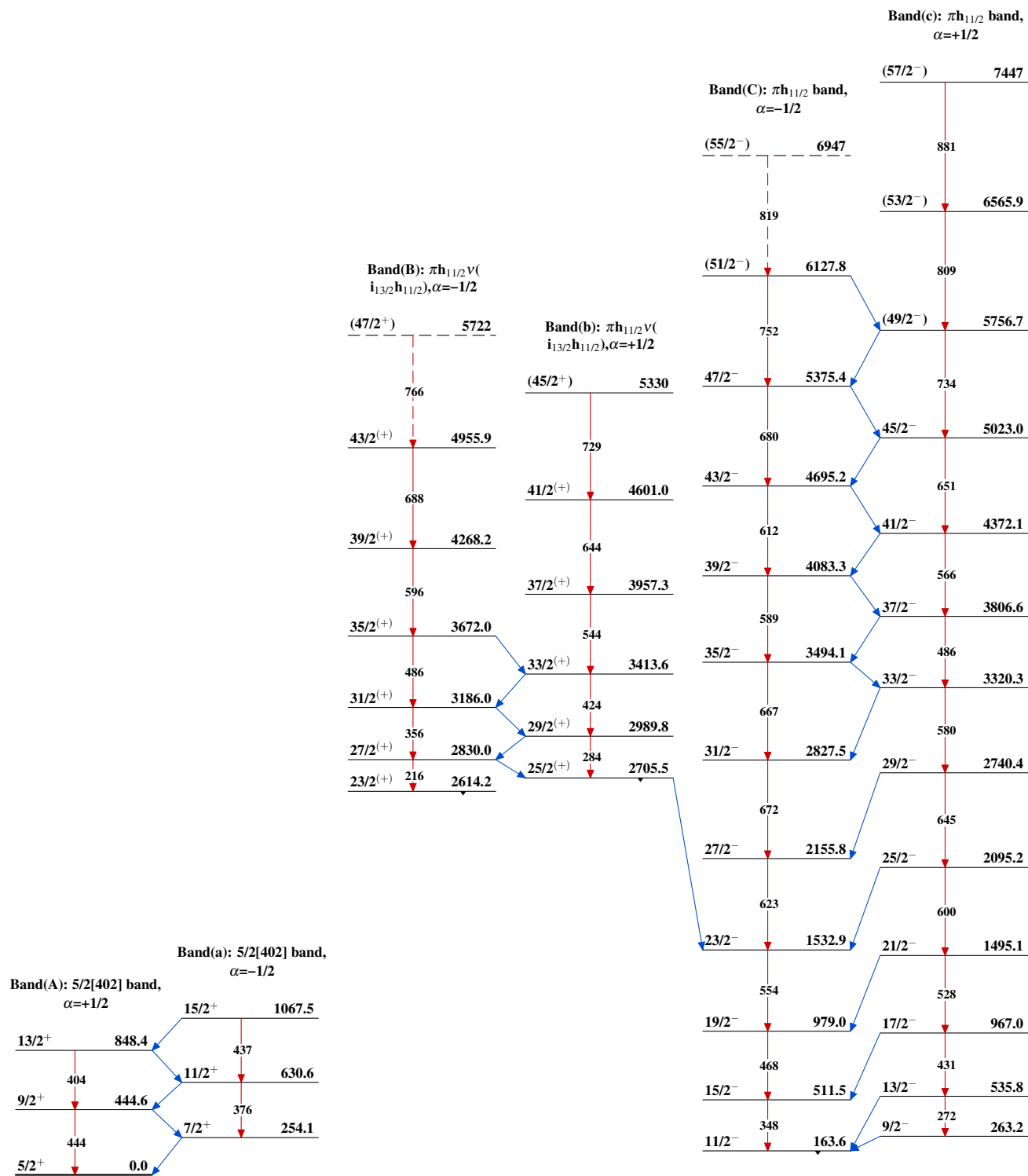
Level Scheme (continued)

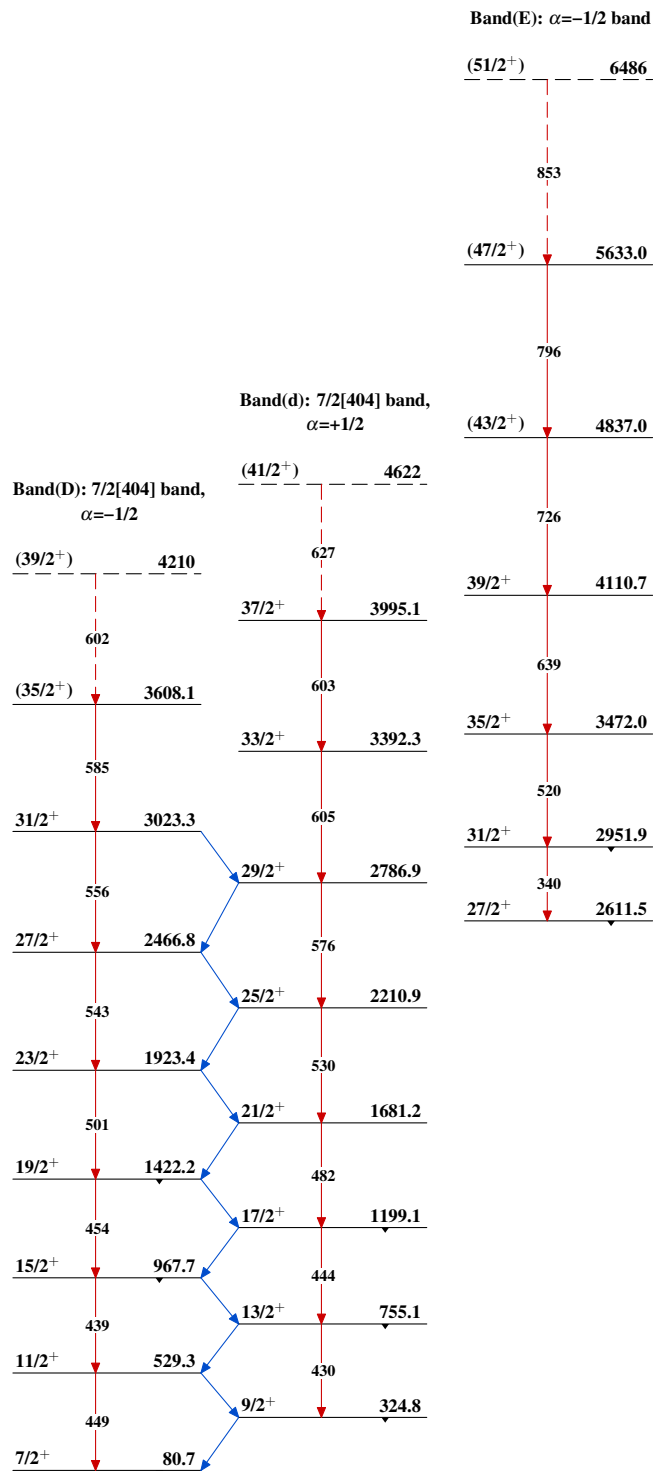
 $^{153}\text{Tb}_{88}$

$^{139}\text{La}(^{18}\text{O},4n\gamma)$ 1998Ha37

Level Scheme (continued)



$^{139}\text{La}(^{18}\text{O},4n\gamma)$ 1998Ha37

$^{139}\text{La}(^{18}\text{O},4n\gamma)$ 1998Ha37 (continued) $^{153}\text{Tb}_{88}$