^{92}Mo(^{51}V,2pnγ) 2003He25

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 154, 1 (2018)	20-Nov-2018

E=205 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO), $\gamma\gamma$(lin pol), $\gamma(\theta)$ with YRAST Ball detector array which consisted of 7 Compton suppressed segmented clover Ge-detectors. In addition, 16 Compton suppressed coaxial Ge detectors were used. Three LEPS detectors were mounted in the array for additional sensitivity to low energy γ rays and x rays.

High-spin states studied by 2003He25 were also studied by 2002Cu05; see ^{107}Ag(^{36}Ar,n2pγ) for data of 2002Cu05.

Level scheme and J^π assignments are those of 2003He25.

There are important differences between this dataset, ^{107}Ag(^{36}Ar,n2pγ), and Adopted Levels, Gammas, coming from different J^π values and 71γ placement. See footnote on 459.5+x level in Adopted.

^{140}Eu Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0+x[@e]	(5$^-$)[&]	125[&] ms *2*	Additional information 1.
170.34+x[d] *10*	6$^-$		
285+x[f] *3*	6$^-$		
361.58+x[e] *14*	7$^-$		
0+y[a]	9$^+$[#]	299.8[b] ns *21*	Additional information 2.
53.5+y *5*	8$^+$[#]		
71.00+y[g] *20*	10$^+$[#]		
148.4+y[i] *4*	9$^+$[#]		
654.85+x[d] *17*	8$^-$		
763.0+x[f] *20*	8$^-$		
898.95+x[e] *16*	9$^-$		
436.9+y[h] *3*	11$^+$[#]		
534.5+y[j] *5*	(11)		
555.0+y[i] *4*	11$^+$		
711.56+y[g] *23*	12$^+$		
1364.70+x[f] *24*	10$^-$		
1376.6+x[d] *3*	10$^-$		
1144.3+y[j] *6*	(13)		
1614.6+x[e] *3*	11$^-$		
1157.53+y[h] *24*	13$^+$[#]		
1202.0+y[i] *3*	13$^+$		
1960.0+x *4*	12$^-$		
1518.8+y[g] *3*	14$^+$		
2169.9+x *3*	12$^-$		
2197.4+x[f] *3*	12$^-$		
1763.6+y[j] *7*	(15)		
2427.8+x[f] *3*	13$^-$		
2444.6+x[e] *4*	13$^-$		
1989.3+y[h] *3*	15$^+$[#]		
2020.4+y[i] *4*	15$^+$		
2597.8+x[f] *4*	14$^-$		
2382.9+y[j] *8*	(17)		
2885.0+x *5*	14$^-$		
2438.8+y[g] *4*	16$^+$		
2500.2+y[h] *4*	17$^+$[#]		

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^{92}Mo(^{51}V,2pnγ) 2003He25 (continued)

^{140}Eu Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
2970.7+x[f] *4*	15$^-$	
2636.4+y[i] *5*	17$^+$	
3424.6+x[f] *5*	16$^-$	
3583.6+x *7*	17$^-$	
3147.9+y[h] *4*	19$^+$[#]	
3790.9+x *5*	17$^-$	E(level),J$^{\pi}$: marked as questionable level with no J^{π} in Adopted because of uncertain placement of its depopulating γ and no J^{π} arguments in 2003He25.
3884.6+x[f] *5*	17$^-$	
3980.4+x *7*	18$^-$	J$^{\pi}$: 18$^-$ not adopted − no argument in 2003He25.
4264.2+x[f] *6*	18$^-$	E(level),J$^{\pi}$: J^{π} not adopted − no argument in 2003He25.
3902.1+y[h] *5*	21$^+$[#]	
4809.5+y[h] *7*	23$^+$[#]	
4905.6+y *6*	23$^+$	
5801.2+y[h] *8*	25$^+$[#]	
0+z[ck]	J	Additional information 3.
153.70+z[k] *20*	J+1	
363.6+z[k] *3*	J+2	
639.2+z[k] *4*	J+3	
1035.9+z[k] *4*	J+4	
1507.1+z[k] *5*	J+5	

[†] From least-squares fit to Eγ′s.

[‡] Based on measured mult and assignment of levels to rotational bands built on 125 ms (first) and and 299 ns (second) isomers. The negative parity bands are built on 5$^-$ (first isomer). TRS deformation parameters: $\beta\approx0.2$, $\gamma\approx\pm25°$.

[#] Assignment of positive parity bands based on syst of N=73,75,77 isotones of Cs, La, Pr, Pm, and Eu (1996Li13), suggesting 9$^+$ for second isomer. Spins are two units higher than reported by 2002Cu05 (see ^{107}Ag(^{36}Ar,n2pγ) dataset).

[@] x=210 *25* (≈50 keV above the 185.3 level, 1991Fi03).

[&] From Adopted Levels, Gammas.

[a] y≈670 (460 keV above 0+x, 5$^-$ level as proposed by 2002Cu05 in ^{107}Ag(^{36}Ar,n2pγ) dataset).

[b] From Adopted Levels.

[c] z>1615+x, since the γ rays are in coincidence with transitions from 1615+x and 898+x levels.

[d] Band(A): $\pi(g_{7/2},d_{5/2})\otimes\nu h_{11/2}$, α=0.

[e] Band(a): $\pi(g_{7/2},d_{5/2})\otimes\nu h_{11/2}$, α=1.

[f] Band(B): $\pi(g_{7/2},d_{5/2})\otimes\nu h_{11/2}$ with mixing between the two π orbitals.

[g] Band(C): $\pi h_{11/2}\nu h_{11/2}$, α=0.

[h] Band(c): $\pi h_{11/2}\nu h_{11/2}$, α=1.

[i] Band(D): $\pi h_{11/2}\otimes\nu h_{11/2}$ most likely conf assigned by 2003He25.

[j] Band(E): band based on J=(11).

[k] Band(F): ΔJ=1 band. Possibly the structure is similar to ΔJ=1 high-spin structure of band $\pi(g_{7/2},d_{5/2})\otimes\nu h_{11/2}$.

^{92}Mo(^{51}V,2pnγ) 2003He25 (continued)

γ(^{140}Eu)

Polarization asymmetry ratios pol=[N(parallel)−N(perpendicular)]/[N(perpendicular)+N(parallel)]; pol=0.09 *2* for M1 and pol=−0.06 *1* for E2 (2003He25).

R(DCO)=I[γ_1(90°), gate γ_2(160°)]/I[γ_1(160°), gate γ_2]. For ΔJ=1 gate, R(DCO)(ΔJ=1)=0.90 *4* and R(DCO)(ΔJ=2)=0.62 *2*; for ΔJ=2 gate R(DCO)(ΔJ=1)=1.71 *8* and R(DCO)(ΔJ=2)=0.85 *2* (2003He25). Nature of gate used for DCO measurement is ΔJ=2, stretched-Q transition, unless stated otherwise.

A_2-values reported by 2003He25 are the ratios A_2/A_0 of the coefficients from $W(\theta)=A_0+A_2P_2\cos(\theta)$ formula; for ΔJ=1 transitions A_2=−0.15 *6*; for ΔJ=2 transitions A_2=0.37 *8* (2003He25).

2003He25 report that the 843, 890, 962 and 1074-keV transitions from 2002Cu05 were not confirmed in the present work. Also, a 71.0-keV transition placed in this work was observed but not placed by 2002Cu05 (see ^{107}Ag(^{36}Ar,n2pγ) dataset).

E_γ	I_γ [†‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
(20.5)		555.0+y	11$^+$	534.5+y	(11)		E_γ: 2003He25 propose this unobserved transition based upon the possible (646.8γ)(386.1γ) coincidence.
71.0 *2*	>130	71.00+y	10$^+$	0+y	9$^+$	(M1+E2)	DCO=2.8 *10*; A_2=+0.6 *6*
94.9 *2*	≥65	148.4+y	9$^+$	53.5+y	8$^+$	(M1+E2)	DCO=1.3 *4*; A_2=+0.57 *23*
153.7 *2*	33 *3*	153.70+z	J+1	0+z	J	M1+E2[@]	DCO=0.9 *3*; A_2=+0.36 *24*
170.0 *2*	39[#] *7*	2597.8+x	14$^-$	2427.8+x	13$^-$	(M1+E2)	170.0γ+170.6γ form a doublet structure.
170.6 *1*	72 *7*	170.34+x	6$^-$	0+x	(5$^-$)	M1+E2	DCO=1.33 *9* pol=+0.16 *21*. 170.0γ+170.6γ form a doublet structure.
191.1 *2*	35 *4*	361.58+x	7$^-$	170.34+x	6$^-$	M1+E2	DCO=1.23 *7*; A_2=+0.14 *8* pol=+0.16 *8*.
209.9 *2*	26 *3*	363.6+z	J+2	153.70+z	J+1	M1+E2[@]	DCO=1.0 *3*; A_2=0.00 *19*
230.4 *1*	34 *3*	2427.8+x	13$^-$	2197.4+x	12$^-$	M1+E2[@]	DCO=0.73 *4* pol=+0.16 *5*.
244.0[b] *2*	≥8	898.95+x	9$^-$	654.85+x	8$^-$	M1+E2[@]	DCO=1.6 *8*
258.0 *2*	12.0 *12*	2427.8+x	13$^-$	2169.9+x	12$^-$	M1+E2[@]	DCO=1.00 *12* pol=+0.16 *7*.
274.7 *3*	16.0 *16*	711.56+y	12$^+$	436.9+y	11$^+$	M1+E2	DCO=1.5 *8* pol=+0.11 *12*.
275.6 *2*	31 *3*	639.2+z	J+3	363.6+z	J+2	M1+E2[@]	DCO=0.96 *21*; A_2=−0.21 *26* pol=+0.29 *13*.
285.4 *3*	>3	285+x	6$^-$	0+x	(5$^-$)	M1+E2[@]	DCO=0.78 *10*; A_2=+0.09 *12* pol=+0.13 *9*.
292.9 *4*	>15	654.85+x	8$^-$	361.58+x	7$^-$	M1+E2[@]	DCO=1.02 *20*; A_2=+0.08 *21* pol=+0.37 *11*.
345.4 *3*	4.0 *4*	1960.0+x	12$^-$	1614.6+x	11$^-$	M1+E2	DCO=1.4 *4*
361.3 *2*	16.0 *16*	1518.8+y	14$^+$	1157.53+y	13$^+$	M1+E2[@]	DCO=0.63 *10*; A_2=−0.23 *23* pol=+0.09 *9*.
362.0 *2*	20 *2*	361.58+x	7$^-$	0+x	(5$^-$)	E2	DCO=1.02 *9* pol=+0.11 *14*.
365.8 *3*	26 *3*	436.9+y	11$^+$	71.00+y	10$^+$	M1+E2	DCO=1.8 *4*; A_2=−0.11 *28* pol=+0.02 *12*.
366.3[b] *2*	4.0 *4*	3790.9+x	17$^-$	3424.6+x	16$^-$		
372.9 *2*	25.0 *25*	2970.7+x	15$^-$	2597.8+x	14$^-$	M1+E2[@]	DCO=1.45 *9* pol=+0.13 *3*.
379.6[b] *2*	1.0 *1*	4264.2+x	18$^-$	3884.6+x	17$^-$		
386.1 *2*	24.0 *24*	534.5+y	(11)	148.4+y	9$^+$	E2	DCO=1.0 *3*; A_2=+0.13 *14* pol=−0.16 *23*.

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^{92}Mo(^{51}V,2pnγ) 2003He25 (continued)

γ(^{140}Eu) (continued)

Eγ	Iγ[†‡]	Ei(level)	$J^π_i$	Ef	$J^π_f$	Mult.	Comments
396.7 *2*	22.0 *22*	1035.9+z	J+4	639.2+z	J+3	M1+E2[@]	DCO=1.29 *17*; A2=−0.10 *23* pol=+0.12 *8*.
396.8 *2*	3.0 *3*	3980.4+x	18⁻	3583.6+x	17⁻		
401.4 *2*	>9	763.0+x	8⁻	361.58+x	7⁻	M1+E2[@]	DCO=1.45 *18*; A2=−0.16 *9* pol=+0.04 *8*.
406.6 *2*	>33	555.0+y	11⁺	148.4+y	9⁺	E2	DCO=0.93 *16*; A2=+0.46 *19* pol=−0.01 *7*.
446.0 *1*	59 *6*	1157.53+y	13⁺	711.56+y	12⁺	M1+E2	DCO=1.77 *11*; A2=−0.10 *14* pol=−0.01 *3*.
454.0 *2*	10 *1*	3424.6+x	16⁻	2970.7+x	15⁻	M1+E2[@]	DCO=2.0 *5*; A2=−0.34 *21* pol=+0.21 *8*.
460.0 *3*	6.0 *6*	3884.6+x	17⁻	3424.6+x	16⁻	M1+E2[@]	DCO=1.4 *4*; A2=+0.20 *28*
470.5 *2*	28 *3*	1989.3+y	15⁺	1518.8+y	14⁺	M1+E2	DCO=3.4 *6* pol=+0.16 *11*.
471.2 *3*	14.0 *14*	1507.1+z	J+5	1035.9+z	J+4	M1+E2	A2=+0.18 *81* pol=+0.09 *7*.
478.1 *4*	>3	763.0+x	8⁻	285+x	6⁻	E2[@]	DCO=0.61 *15*
483.5 *4*	5.0 *5*	555.0+y	11⁺	71.00+y	10⁺	M1+E2	DCO=1.9 *10*
484.5 *2*	>20	654.85+x	8⁻	170.34+x	6⁻	E2[@]	DCO=0.69 *4* pol=−0.04 *4*.
490.4 *3*	16.0 *16*	1202.0+y	13⁺	711.56+y	12⁺	M1+E2	DCO=2.7 *9*; A2=−0.46 *46* pol=+0.17 *9*.
502.1 *4*	23.0 *23*	2020.4+y	15⁺	1518.8+y	14⁺	M1+E2	DCO=2.1 *5*; A2=+0.35 *36*
510.9 *2*	58 *6*	2500.2+y	17⁺	1989.3+y	15⁺	E2	DCO=0.98 *14*
511.5 *3*	<19	3147.9+y	19⁺	2636.4+y	17⁺	(E2)	pol=+0.03 *6*.
537.4 *1*	28 *3*	898.95+x	9⁻	361.58+x	7⁻	E2[@]	DCO=0.78 *5* pol=−0.05 *4*.
601.7 *2*	>14	1364.70+x	10⁻	763.0+x	8⁻	E2[@]	DCO=0.87 *6*; A2=+0.23 *16* pol=−0.01 *4*.
609.8 *4*	13.0 *13*	1144.3+y	(13)	534.5+y	(11)	E2	DCO=1.1 *4*
612.9 *5*	8.0 *8*	3583.6+x	17⁻	2970.7+x	15⁻	(E2)[@]	DCO=1.5 *3*; A2=−0.23 *18* pol=+0.11 *6*.
616.0 *5*	19.0 *19*	2636.4+y	17⁺	2020.4+y	15⁺	(E2)[&]	
619.3[a] *3*	≈10[a]	1763.6+y	(15)	1144.3+y	(13)	E2	DCO=1.5 *3*
619.3[a] *3*	≈10[a]	2382.9+y	(17)	1763.6+y	(15)	E2	
640.6 *1*	100	711.56+y	12⁺	71.00+y	10⁺	E2	DCO=1.02 *9* pol=−0.12 *5*.
646.8 *3*	35[#] *24*	1202.0+y	13⁺	555.0+y	11⁺	(E2)	
647.7 *2*	53 *5*	3147.9+y	19⁺	2500.2+y	17⁺	E2	DCO=0.87 *14* pol=−0.03 *6*.
709.4 *4*	>22	1364.70+x	10⁻	654.85+x	8⁻	E2[@]	DCO=0.76 *8* pol=−0.01 *11*.
715.6 *2*	21.0 *21*	1614.6+x	11⁻	898.95+x	9⁻	E2	DCO=1.01 *7* pol=−0.08 *4*.
720.6 *2*	10 *1*	1157.53+y	13⁺	436.9+y	11⁺	E2[@]	DCO=0.49 *10*
722.0 *3*	>10	1376.6+x	10⁻	654.85+x	8⁻	E2[@]	DCO=0.63 *6*
754.2 *3*	44 *4*	3902.1+y	21⁺	3147.9+y	19⁺	E2	DCO=0.88 *12*; A2=+0.6 *3* pol=−0.07 *9*.
787.3 *3*	38 *4*	1989.3+y	15⁺	1202.0+y	13⁺	E2	DCO=1.06 *10*; A2=+0.5 *3* pol=−0.06 *7*.
805.3 *3*	>12	2169.9+x	12⁻	1364.70+x	10⁻	E2[@]	DCO=0.59 *9* pol=−0.07 *11*.

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^{92}Mo(^{51}V,2pnγ) 2003He25 (continued)

γ(^{140}Eu) (continued)

E_γ	I_γ [†‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	Comments
807.3 *2*	5.0 *5*	1518.8+y	14$^+$	711.56+y	12$^+$	E2	DCO=1.22 *16*; A_2=+0.53 *17* pol=−0.11 *4*.
817.5 *5*	20[#] *10*	2020.4+y	15$^+$	1202.0+y	13$^+$	E2	DCO=1.12 *21* pol=−0.13 *14*.
821.0 *3*	>10	2197.4+x	12$^-$	1376.6+x	10$^-$	E2[@]	DCO=2.5 *8* pol=−0.07 *12*.
825.3 *15*	7.0 *7*	3424.6+x	16$^-$	2597.8+x	14$^-$	(E2)[&]	
830.0 *3*	15.0 *15*	2444.6+x	13$^-$	1614.6+x	11$^-$	E2	DCO=0.92 *17*
831.9 *3*	30 *3*	1989.3+y	15$^+$	1157.53+y	13$^+$	E2	DCO=0.95 *23*; A_2=+0.34 *13* pol=−0.12 *9*.
832.3 *3*	>24	2197.4+x	12$^-$	1364.70+x	10$^-$	E2[@]	DCO=0.62 *5* pol=−0.11 *6*.
907.4 *4*	13.0 *13*	4809.5+y	23$^+$	3902.1+y	21$^+$	(E2)[&]	
913.7 *5*	3.0 *3*	3884.6+x	17$^-$	2970.7+x	15$^-$		
920.0 *3*	27 *3*	2438.8+y	16$^+$	1518.8+y	14$^+$	E2	DCO=1.11 *13*; A_2=+0.7 *4* pol=−0.28 *11*.
925.0 *3*	4.0 *4*	2885.0+x	14$^-$	1960.0+x	12$^-$	E2	DCO=0.82 *18* pol=−0.62 *23*.
991.7 *4*	11.0 *11*	5801.2+y	25$^+$	4809.5+y	23$^+$	(E2)[&]	
1003.5 *3*	18.0 *18*	4905.6+y	23$^+$	3902.1+y	21$^+$	E2	DCO=1.3 *4*

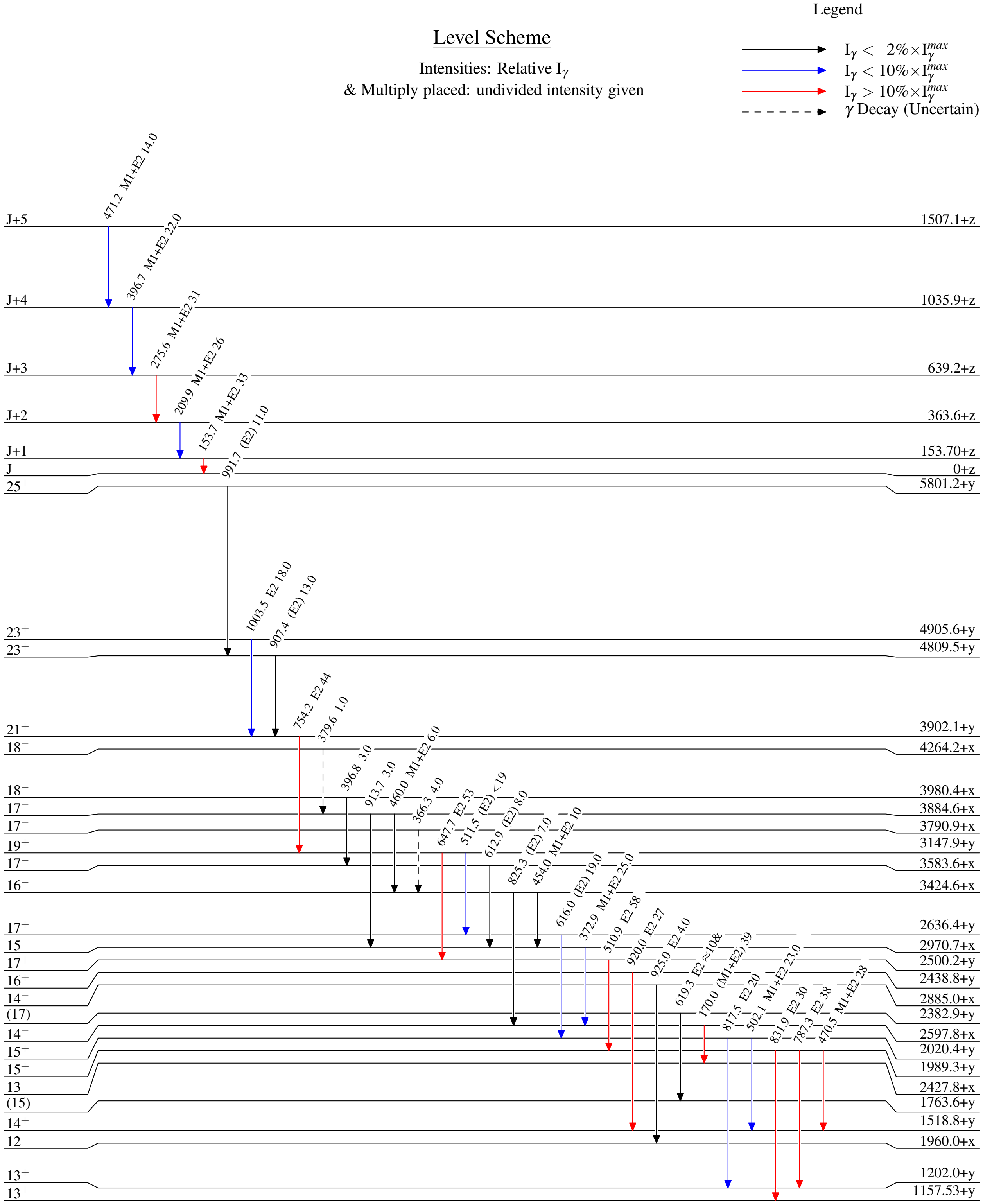
[†] According to 2003He25, the uncertainties are ≈10%, unless stated otherwise. ΔIγ′s presented were calculated by evaluator (Iγ figures with decimal point resulted from rounding-off rule).
[‡] According to 2003He25, array efficiencies for transitions below Eγ≈121.8 keV are not well defined.
[#] ΔIγ value given by 2003He25.
[@] DCO value corresponds to gate on ΔJ=1, stretched-D transition.
[&] Tentatively adopted by 2003He25 (no proof of measurement in Table 1).
[a] Multiply placed with undivided intensity.
[b] Placement of transition in the level scheme is uncertain.

$^{92}Mo(^{51}V,2pn\gamma)$ 2003He25

Level Scheme

Intensities: Relative I_γ

& Multiply placed: undivided intensity given



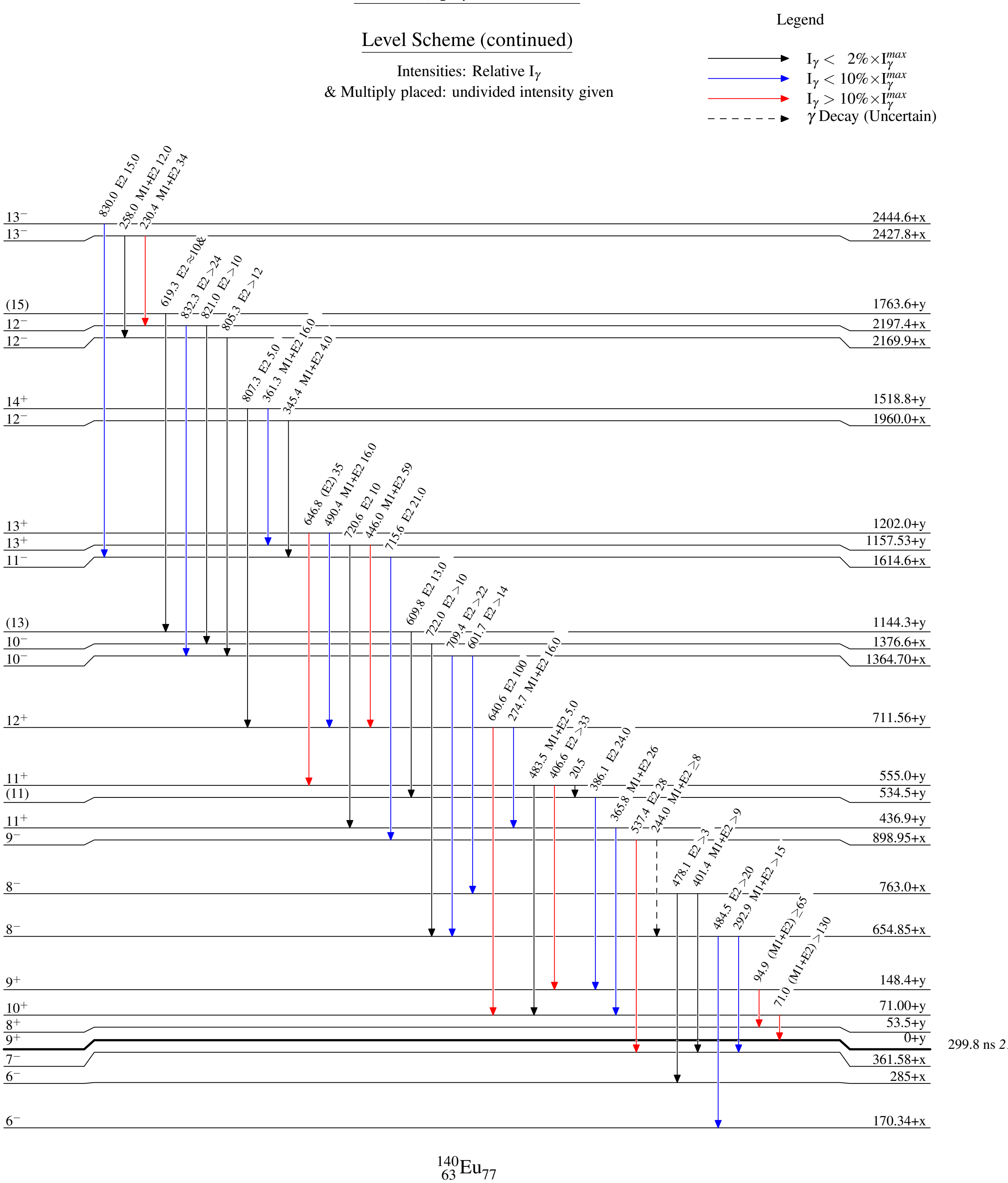
$^{140}_{63}Eu_{77}$

^{92}Mo(^{51}V,2pnγ) 2003He25

Level Scheme (continued)

Intensities: Relative I_γ

& Multiply placed: undivided intensity given

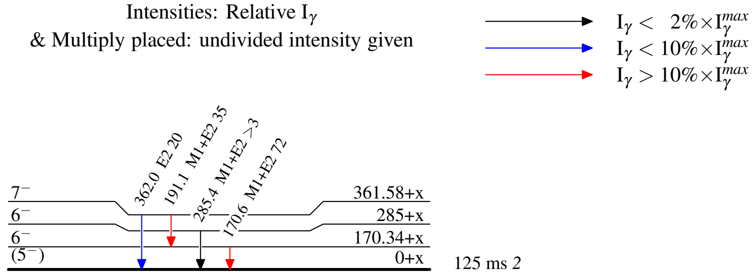


^{92}Mo(^{51}V,2pnγ) 2003He25

Level Scheme (continued)

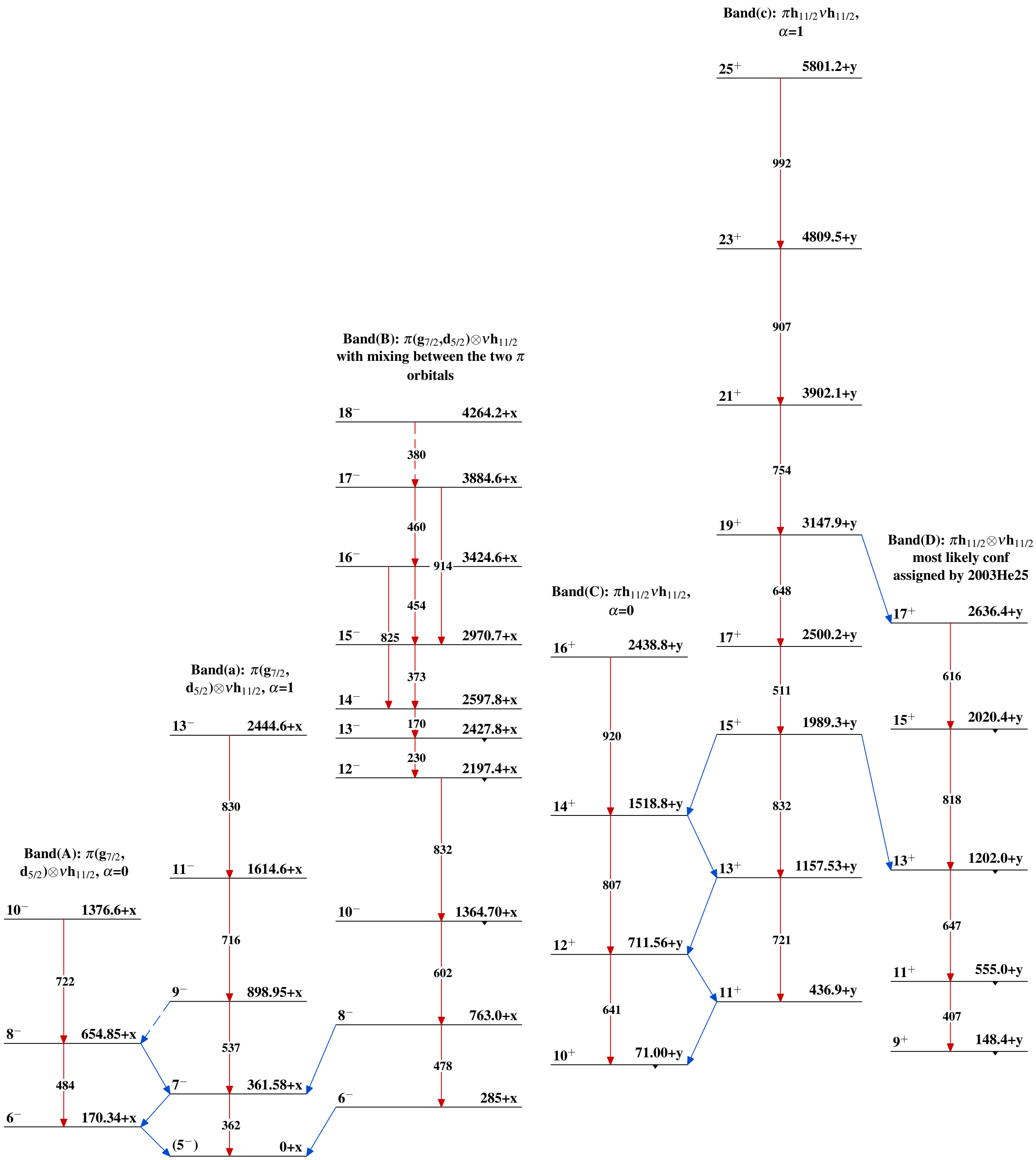
Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend



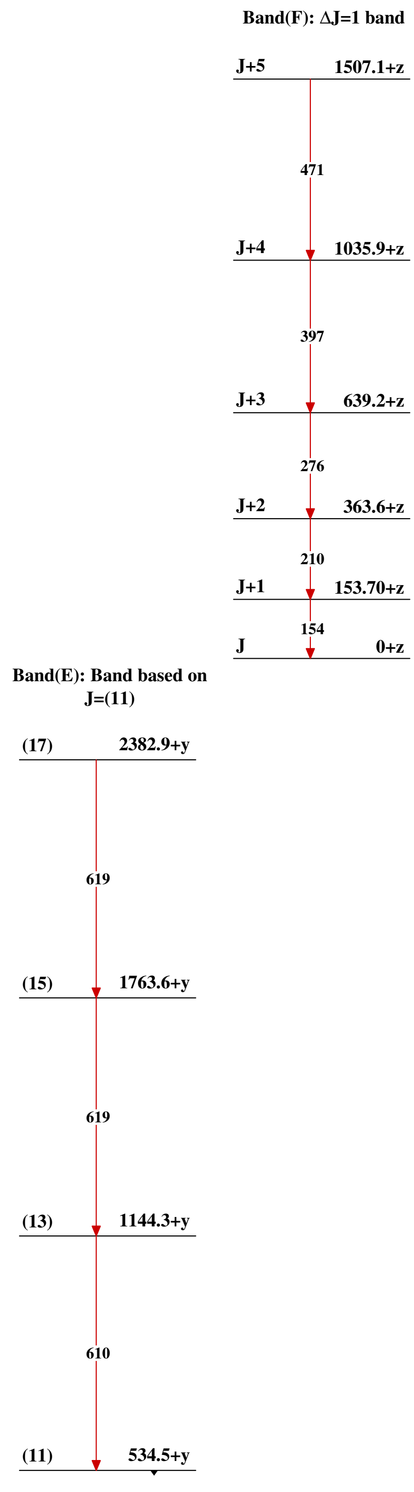
$^{140}_{63}Eu_{77}$

$^{92}Mo(^{51}V,2pn\gamma)$ 2003He25



$^{140}_{63}Eu_{77}$

$^{92}Mo(^{51}V,2pn\gamma)$ 2003He25 (continued)



$^{140}_{63}Eu_{77}$