^{248}Cm SF decay 2001Ur01,2004Ur06

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 111, 525 (2010)	19-Nov-2009

Parent: ^{248}Cm: E=0.0; $J^\pi=0^+$; $T_{1/2}=3.48\times10^5$ y *6*; %SF decay=?

^{248}Cm-From 1998Ak04 (Adopted Levels).

2001Ur01,2004Ur06 (also 2005PiZX): measured Eγ, Iγ, γγ, γ(θ) using EUROGAM-2 spectrometer comprised of 52 large Ge detectors in anti-Compton shields including 24 four-crystal (CLOVER) detectors and 4 LEPS detectors.

All data are from 2001Ur01 unless otherwise indicated.

^{97}Sr Levels

E(level)†	J^π‡	Comments
0.0	$1/2^+$	J^π: from Adopted Levels.
167.1 *2*	$3/2^+$	
308.1 *3*	$7/2^+$	
522.2 *2*	$(1/2^+)$	J^π: deduced by 2001Ur01 from observed branching ratios; π from 1990Lh02 (^{97}Rb β^- decay).
585.0[&] *2*	$3/2^+$	
600.6 *2*	$(3/2^+)$	J^π: deduced by 2001Ur01 from observed branching ratios; π from 1990Lh02 (^{97}Rb β^- decay).
644.7[a] *2*	$3/2^-$	
687.0[@] *2*	$5/2^+$	β_2=0.34 *2* (2001Ur01) β_2: deduced from Q_0=3.05 *15* eb for band based on $5/2^+$, α=+1/2.
713.7[b] *2*	$5/2^-$	
771.3[a] *2*	$7/2^-$	β_2=0.32 *2* (2001Ur01) β_2: deduced from Q_0=2.80 *15* eb for band based on $3/2^-$, α=−1/2.
822.5[&] *3*	$7/2^+$	
830.7[#c] *3*	$(9/2^+)$	β_2=0.441 *26* (2004Ur06) β_2: deduced from Q_0=3.86 *23* eb for ν9/2[404] isomer band. J^π: from similarity to 9/2[404], 1038.8 isomeric level In ^{99}Zr (2003Ur01).
946.4[b] *3*	$(9/2^-)$	
992.3[@] *4*	$9/2^+$	
995.0[a] *3*	$11/2^-$	
1036.0[#c] *4*	$(11/2^+)$	
1198.0[&] *4*	$11/2^+$	
1276.0[#c] *4*	$(13/2^+)$	
1278 *1*	$(13/2^-)$	
1383.4[a] *5*	$15/2^-$	
1435.2[@] *5*	$13/2^+$	
1548.4[#c] *5*	$(15/2^+)$	
1707.7[&] *5*	$15/2^+$	
1852.8[#c] *5*	$(17/2^+)$	
1906.2[a] *6*	$19/2^-$	
2010.3[@] *6*	$17/2^+$	
2188.3[#c] *6*	$(19/2^+)$	
2345.7[&] *6*	$(19/2^+)$	
2559.7[a] *6*	$23/2^-$	
2712.3[@] *7*	$(21/2^+)$	
3333.7[a] *7*	$(27/2^-)$	

† From least-squares fit to Eγ′s, assuming Δ(Eγ)=0.3 keV for each γ ray.

‡ ADOPTED by 2004Ur06 for ν9/2[404] isomer band (based on band structure) and by 2001Ur01 for the other levels; these values

Continued on next page (footnotes at end of table)

^{248}Cm SF decay 2001Ur01,2004Ur06 (continued)

^{97}Sr Levels (continued)

can differ from those adopted In this evaluation − see the Adopted Levels, Gammas dataset.

[#] Level from 2004Ur06.

[@] Band(A): Band based on $5/2^+$, α=+1/2.

[&] Band(a): Band based on $3/2^+$, α=−1/2.

[a] Band(B): Band based on $3/2^-$, α=−1/2.

[b] Band(b): Band based on $5/2^-$, α=+1/2.

[c] Band(C): ν9/2[404] isomer band.

$\gamma(^{97}Sr)$

Identification of new transitions In ^{97}Sr was achieved by gating on known transitions In this nucleus and In the complementary barium fragments.

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[#]	Comments
44.3	6 *2*	644.7	$3/2^-$	600.6	$(3/2^+)$			
48.5	5 *2*	995.0	$11/2^-$	946.4	$(9/2^-)$			
57.6	30 *5*	771.3	$7/2^-$	713.7	$5/2^-$	M1+E2	0.26 *+9−12*	α(exp)=1.2 *3* A_2=−0.06 *2*; A_4=+0.01 *2* Mult.: M1+E2 from α(exp) for 57.6γ; compatible with D(+Q) for 57.6γ and ΔJ=2 Q, E2 for 223.8γ from 57.6γ-223.8γ $\alpha n\gamma$ correlation.
59.4	12 *5*	644.7	$3/2^-$	585.0	$3/2^+$	D		A_2=−0.13 *4*; A_4=+0.03 *3* Mult.: compatible with D for 59.4γ and ΔJ=2 Q, E2 for 223.8γ from 59.4γ-223.8γ $\alpha n\gamma$ correlation.
69.0	25 *5*	713.7	$5/2^-$	644.7	$3/2^-$	M1+E2	1.00 *+65−39*	α(exp)=2.2 *8*
84.2	15 *3*	771.3	$7/2^-$	687.0	$5/2^+$	E1		α(exp)=0.09 *3*
102.0	6 *2*	687.0	$5/2^+$	585.0	$3/2^+$	M1+E2	0.88 *+61−41*	α(exp)=0.5 *2*
113.0	6 *2*	713.7	$5/2^-$	600.6	$(3/2^+)$			
123.0	4 *2*	644.7	$3/2^-$	522.2	$(1/2^+)$			
126.6	5 *2*	771.3	$7/2^-$	644.7	$3/2^-$	Q		A_2=+0.15 *6*; A_4=−0.2 *5* Mult.: compatible with ΔJ=2 Q, E2 for 126.6γ and ΔJ=2 Q, E2 for 223.8γ from 126.6γ-223.8γ $\alpha n\gamma$ correlation.
128.8	9 *2*	713.7	$5/2^-$	585.0	$3/2^+$	E1		α(exp)=0.05 *3*
135.4	10 *3*	822.5	$7/2^+$	687.0	$5/2^+$	(E2(+M1))		α(exp)=0.6 *2* Mult.,δ: α(exp) is outside the range α(M1)=0.07 − α(E2)=0.34, whence the tentative multipolarity.
141.0	19 *3*	308.1	$7/2^+$	167.1	$3/2^+$	Q		Mult.: see comment on 167.1γ.
167.1	100 *5*	167.1	$3/2^+$	0.0	$1/2^+$	D		A_2=−0.09 *2*; A_4=0.00 *2* Mult.: compatible with ΔJ=1 D for 167.1γ and ΔJ=2 Q, E2 for 141.0γ from 167.1γ-141.0γ $\alpha n\gamma$ correlation.
175.0	4 *2*	946.4	$(9/2^-)$	771.3	$7/2^-$			
205.6[@]		1036.0	$(11/2^+)$	830.7	$(9/2^+)$			
223.8	39 *3*	995.0	$11/2^-$	771.3	$7/2^-$	Q		Mult.: see comments on 57.6γ, 59.4γ, 126.6γ and 388.4γ.
232.7	5 *2*	946.4	$(9/2^-)$	713.7	$5/2^-$			
237.5	5 *2*	822.5	$7/2^+$	585.0	$3/2^+$	Q		A_2=+0.10 *2*; A_4=−0.04 *3* Mult.: compatible with ΔJ=2 Q, E2 for

Continued on next page (footnotes at end of table)

^{248}Cm SF decay 2001Ur01,2004Ur06 (continued)

γ(^{97}Sr) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
							237.5γ and ΔJ=2 Q, E2 for 375.5γ from 237.5γ-375.5γ αnγ correlation.
239.7[@]		1276.0	(13/2$^+$)	1036.0	(11/2$^+$)		I_γ: see comment on 445.4.
272.4[@]		1548.4	(15/2$^+$)	1276.0	(13/2$^+$)		I_γ: see comment on 512.1γ.
283	2 *1*	1278	(13/2$^-$)	995.0	11/2$^-$		
304.4[@]		1852.8	(17/2$^+$)	1548.4	(15/2$^+$)		I_γ: see comment on 576.7γ.
305.3	18 *3*	992.3	9/2$^+$	687.0	5/2$^+$	Q	Mult.: see comments on 442.9γ and 687.0γ.
332[&]		1278	(13/2$^-$)	946.4	(9/2$^-$)		
335.5[@]		2188.3	(19/2$^+$)	1852.8	(17/2$^+$)		
355.3	4 *2*	522.2	(1/2$^+$)	167.1	3/2$^+$		
375.5	12 *3*	1198.0	11/2$^+$	822.5	7/2$^+$	Q	Mult.: see comments on 237.5γ and 509.7γ.
379.0	4 *2*	687.0	5/2$^+$	308.1	7/2$^+$		
388.4	25 *3*	1383.4	15/2$^-$	995.0	11/2$^-$	Q	A_2=+0.09 *1*; A_4=−0.02 *1* Mult.: compatible with ΔJ=2 Q, E2 for 388.4γ and ΔJ=2 Q, E2 for 223.8γ from 388.4γ-233.8γ αnγ correlation.
417.9	15 *3*	585.0	3/2$^+$	167.1	3/2$^+$		
433.5	6 *2*	600.6	(3/2$^+$)	167.1	3/2$^+$		
442.9	9 *2*	1435.2	13/2$^+$	992.3	9/2$^+$	Q	A_2=+0.09 *1*; A_4=+0.01 *2* Mult.: compatible with ΔJ=2 Q, E2 for 442.9γ and ΔJ=2 Q, E2 for 305.3γ from 442.9γ-305.3γ αnγ correlation.
445.4[@]		1276.0	(13/2$^+$)	830.7	(9/2$^+$)		I_γ: Iγ(445.4)/Iγ(239.7)=1.0 *4*/3.0 *2* (2004Ur06).
477.3	10 *2*	644.7	3/2$^-$	167.1	3/2$^+$		
509.7	8 *2*	1707.7	15/2$^+$	1198.0	11/2$^+$	Q	A_2=+0.07 *3*; A_4=0.02 *3* Mult.: compatible with ΔJ=2 Q, E2 for 509.7γ and ΔJ=2 Q, E2 for 375.5γ from 509.7γ-375.5γ αnγ correlation.
512.1[@]		1548.4	(15/2$^+$)	1036.0	(11/2$^+$)		I_γ: Iγ(512.1)/Iγ(272.4)=1.0 *1*/1.8 *2* (2004Ur06).
519.9	19 *2*	687.0	5/2$^+$	167.1	3/2$^+$	D	A_2=−0.06 *1*; A_4=+0.01 *2* Mult.: compatible with ΔJ=1 D for 519.9γ and sum of ΔJ=2 Q, E2 transitions (probably 305.3γ+442.9γ) from 519.9γ-sum αnγ correlation.
522.0[@]		830.7	(9/2$^+$)	308.1	7/2$^+$		E_γ: the 522γ is complex, mixed with impurity lines.
522.4	5 *2*	522.2	(1/2$^+$)	0.0	1/2$^+$		
522.8	15 *3*	1906.2	19/2$^-$	1383.4	15/2$^-$	Q	A_2=+0.08 *2*; A_4=0.00 *2* Mult.: compatible with ΔJ=2 Q, E2 for 522.8γ and sum of ΔJ=2 Q, E2 transitions (probably 233.8γ+388.4γ) from 522.8γ-sum αnγ correlation.
575.1	5 *2*	2010.3	17/2$^+$	1435.2	13/2$^+$	Q	A_2=+0.11 *3*; A_4=−0.05 *4* Mult.: compatible with ΔJ=2 Q, E2 for 575.1γ and sum of ΔJ=2 Q, E2 transitions (probably 305.3γ+442.9γ) from 575.1γ-sum αnγ correlation.
576.7[@]		1852.8	(17/2$^+$)	1276.0	(13/2$^+$)		I_γ: Iγ(576.7)/Iγ(304.4)=1.0 *1*/1.2 *1* (2004Ur06).
584.9	30 *5*	585.0	3/2$^+$	0.0	1/2$^+$		
600.6	10 *3*	600.6	(3/2$^+$)	0.0	1/2$^+$		
638.0	3 *1*	2345.7	(19/2$^+$)	1707.7	15/2$^+$		
644.5	21 *3*	644.7	3/2$^-$	0.0	1/2$^+$		
653.5	8 *2*	2559.7	23/2$^-$	1906.2	19/2$^-$	Q	A_2=+0.07 *2*; A_4=+0.02 *2* Mult.: compatible with ΔJ=2 Q, E2 for 653.5γ and sum of ΔJ=2 Q, E2 transitions (probably 233.8γ+388.4γ) from 575.1γ-sum αnγ correlation.
687.0	2 *1*	687.0	5/2$^+$	0.0	1/2$^+$	Q	A_2=+0.10 *3*; A_4=+0.04 *3* Mult.: compatible with ΔJ=2 Q, E2 for 687.0γ and ΔJ=2 Q, E2 for 305.3γ from 687.0γ-305.3γ αnγ correlation.
702.0	2 *1*	2712.3	(21/2$^+$)	2010.3	17/2$^+$		
774.0	3 *1*	3333.7	(27/2$^-$)	2559.7	23/2$^-$		

Continued on next page (footnotes at end of table)

^{248}Cm SF decay 2001Ur01,2004Ur06 (continued)

$\gamma(^{97}Sr)$ (continued)

† Relative intensities from 2001Ur01. 2004Ur06 report branching ratios for γ's of $\nu 9/2[404]$ isomer band (see table comments).
‡ Deduced by evaluator from angular correlation and total conversion coefficients (from intensity balance) measured by 2001Ur01 (see comments In γ table). For angular correlations the following typical values are used: A_2=+0.102, A_4=+0.009 for stretched Q − stretched Q (for 4-2-2 like cascade); A_2=−0.071, A_4=0 for stretched D − stretched Q (for 3-2-2 like cascade); A_2=+0.250, A_4=0 for pure D − stretched Q (2-2-0 like cascade); A_2=−0.022, A_4=+0.003 for stretched Q − pure Q (4-2-2 like cascade). All stretched Q γ's adopted here are E2′s In the Adopted Levels, Gammas dataset.
# Estimated by evaluator from α(exp) values reported by 2001Ur01.
@ From 2004Ur06 ($\nu 9/2[404]$ ISOMER BAND).
& Placement of transition in the level scheme is uncertain.

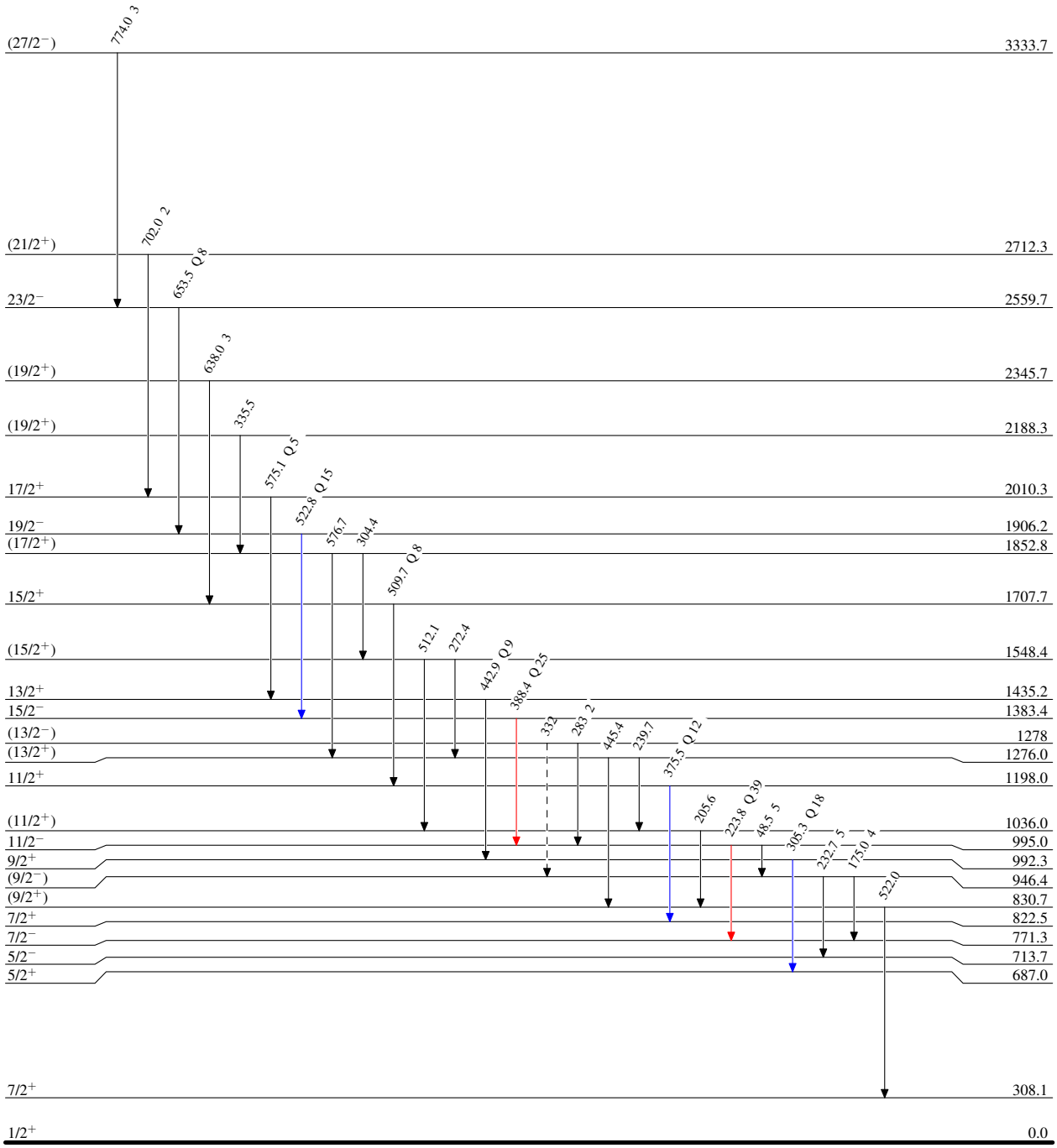
^{248}Cm SF decay 2001Ur01,2004Ur06

Level Scheme

Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)

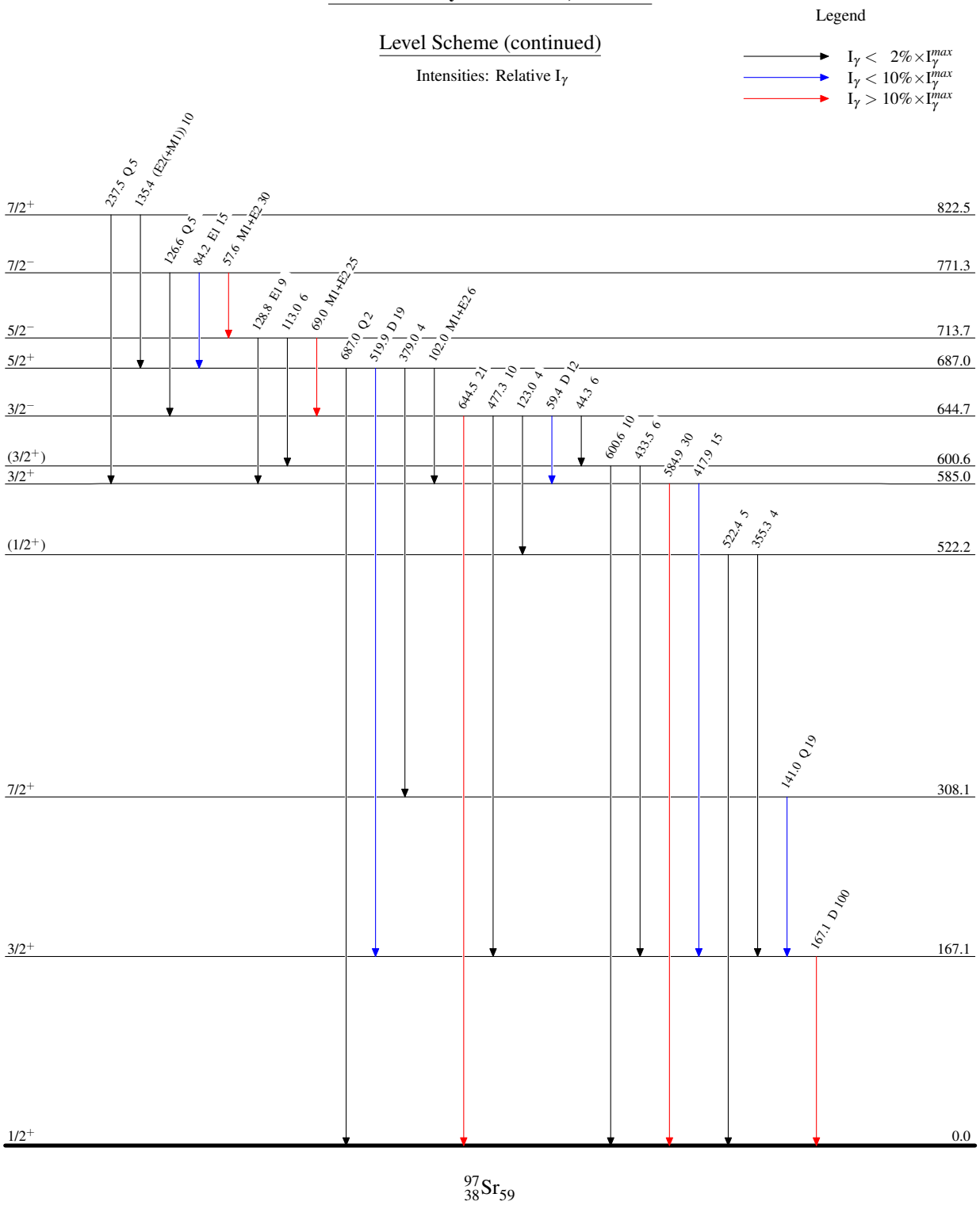


$^{97}_{38}Sr_{59}$

^{248}Cm SF decay 2001Ur01,2004Ur06

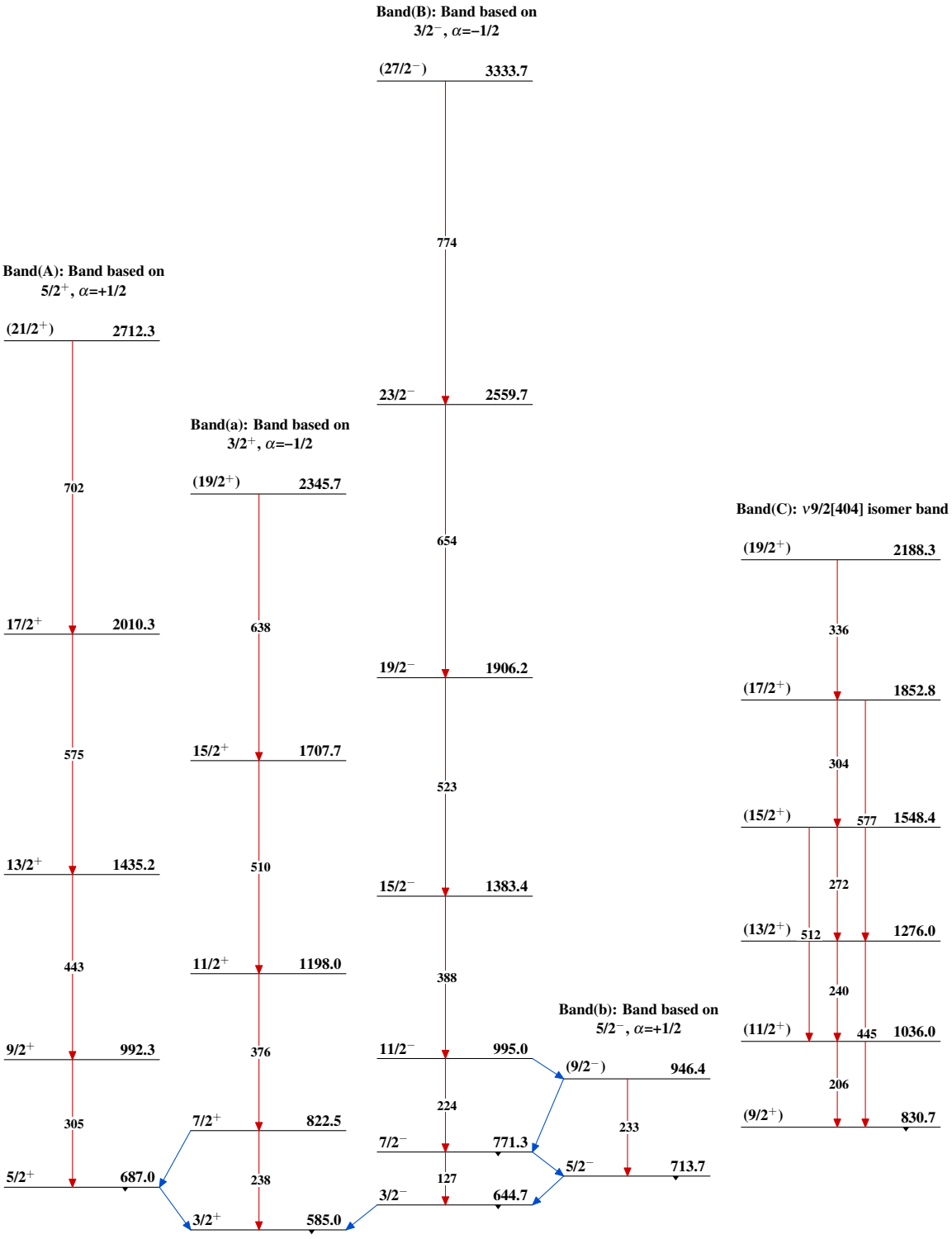
Level Scheme (continued)

Intensities: Relative I_γ



$^{97}_{38}Sr_{59}$

^{248}Cm SF decay 2001Ur01,2004Ur06



$^{97}_{38}Sr_{59}$