

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, A. A. Rodionov and S. Sakharov, Balraj Singh		NDS 104,497 (2005)	10-Feb-2005

$Q(\beta^-)=1278.7\ 23$; $S(n)=7169\ 6$; $S(p)=6031.6\ 20$; $Q(\alpha)=-1842\ 5$ [2012Wa38](#)

Note: Current evaluation has used the following Q record 1278.9 [22 7167 5 6029.7 21 -1843 4](#) [2003Au03](#).

Mass measurements: [1999Am05](#), [1990St25](#), [1986Au02](#).

Moments: [1981Th06](#), [1975Ac01](#), [1971St12](#), [1969Sc15](#), [1968Ac01](#).

Isotope shifts, charge radii: [1987Al25](#), [1978Hu08](#), [1975U102](#).

[1966Mo04](#): $^{133}\text{Cs}(^{14}\text{N},^{15}\text{N})$ $E=140$ MeV. Measured $\sigma(\theta)$.

[Additional information 1](#).

 ^{132}Cs LevelsCross Reference (XREF) Flags

A	$^{124}\text{Sn}(^{11}\text{B},3n\gamma)$	D	$^{133}\text{Cs}(\gamma,n)$
B	$^{124}\text{Sn}(^{13}\text{C},4np\gamma)$	E	$^{133}\text{Cs}(d,t)$
C	$^{130}\text{Te}(^6\text{Li},4n\gamma)$		

$E(\text{level})^\dagger$	J^π	$T_{1/2}$	XREF	Comments
0	2^+	6.480 d 6	A CDE	$\% \epsilon + \% \beta^+ = 98.13\ 9$; $\% \beta^- = 1.87\ 9$ $\mu = +2.222\ 7$ (1975Ac01 , 1989Ra17) $Q = +0.508\ 7$ (1975Ac01 , 1989Ra17) J^π : atomic beam (1958Ni27); $L(d,t)=2$. $T_{1/2}$: weighted average of 6.48 d 3 (1960Wh05), 6.54 d 3 (1962Ro07), 6.465 d 12 (1971Ru11), 6.483 d 6 (1973Du08), 6.474 d 14 (1973Gi06). Other: 6.587 d 5 (1964De18). The LWM method (Limitation of relative statistical weight) gives 6.53 d 5 using all the measured values, including that from 1964De18 . $\% \epsilon + \% \beta^+$, $\% \beta^-$: from total intensity balance assuming no direct β feeding of ^{132}Xe and ^{132}Ba g.s. μ : optical-level crossing (1975Ac01). Others: +2.23 1 (LASER spectroscopy, 1981Th06); +2.24 1 (optical double resonance, 1969Sc15); +2.23 2 (atomic beam, 1958Ni27). Q : optical-level crossing (1975Ac01). Others: +0.49 2 (LASER spectroscopy, 1981Th06); +0.469 10 (optical double resonance, 1968Ac01 , 1971St12).
86.2 4	(3^+)		A CDE	XREF: D(91).
108.3 4	(4^+)		A CDE	J^π : $L(d,t)=0+2$. XREF: D(116). J^π : $L(d,t)=0+2$.
136	$(3^+, 4^+)$		dE	J^π : $L(d,t)=2+0$.
153	$(^-)$		dE	J^π : $L(d,t)=5$.
183.6 6	(4^+)		A CdE	J^π : $L(d,t)=0+2$.
185.9 6	(5)		A Cd	
213 2			D	
240.1 5	(5^-)		A CD	XREF: D(248).
270 3			D	
291 2			D	
311.7 ^b 8	(7^-)		ABCD	
327 2			D	
352 2			D	
379.3 ^d 8	(8^-)		ABCD	XREF: D(375).
400 2			D	
426 2			D	
505 2			D	

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Adopted Levels, Gammas (continued) ^{132}Cs Levels (continued)

E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF	E(level) [†]	J ^π [‡]	XREF
521.2		D	2201.6 ^{&} 9	(12 ⁺)	BC	3389.5 ^a 9	(16 ⁺)	ABC
537.6 ^b 8	(8 ⁻)	ABC	2316.0 ^e 10	(13 ⁻)	AB	3585.9 ^g 11	(16 ⁻)	B
551.2		D	2368.7 9	(13 ⁺)	BC	3665.7 ^f 16	(17 ⁻)	AB
787.8 ^e 8	(9 ⁻)	ABC	2395.7 ^a 9	(14 ⁺)	ABC	3759.1 ^a 10	(17 ⁺)	B
980.0 ^c 8	(9 ⁻)	AB	2410.0 [@] 9	(13 ⁺)	ABC	3788.7 [#] 9	(16 ⁺)	AB
1081.5 ^d 9	(10 ⁻)	AB	2515.4 ^{&} 9	(13 ⁺)	BC	3985.6 ^g 12	(17 ⁻)	AB
1131.3 [@] 8	(9 ⁺)	ABC	2636.0 ^f 11	(13 ⁻)	AB	4172.8 ^f 10	(18 ⁻)	B
1214.7 ^b 9	(10 ⁻)	AB	2772.8 ^f 10	(14 ⁻)	AB	4187.0 ^e 11	(17 ⁻)	B
1281.9 [#] 8	(10 ⁺)	ABC	2865.1 [#] 9	(14 ⁺)	ABC	4241.5 [@] 10	(17 ⁺)	B
1474.6 ^e 9	(11 ⁻)	AB	2868.5 ^d 10	(14 ⁻)	AB	4386.3 ^a 9	(18 ⁺)	ABC
1683.5 [@] 9	(11 ⁺)	ABC	2893.6 ^{&} 9	(14 ⁺)	B	4487.4 ^g 11	(18 ⁻)	B
1729.2 ^{&} 9	(10 ⁺)	BC	2909.7 9	(14 ⁺)	BC	4665.5 [#] 10	(18 ⁺)	B
1826.1 ^c 9	(11 ⁻)	AB	2988.7 ^f 11	(15 ⁻)	AB	4755.9 ^f 11	(19 ⁻)	B
1835.2 8	(11 ⁺)	ABC	3028.9 ^a 9	(15 ⁺)	B	4943.7 ^g 11	(19 ⁻)	B
1891.2 ^{&} 9	(11 ⁺)	BC	3165.3? 14		A	5073.6 [@] 10	(19 ⁺)	B
1933.9 ^d 9	(12 ⁻)	AB	3232.0 ^e 10	(15 ⁻)	AB	5212.4 ^a 10		B
1982.0 [#] 9	(12 ⁺)	ABC	3270.9 ^f 15	(16 ⁻)	AB	5423.6 ^f 10	(20 ⁻)	B
1987.9 ^a 9	(12 ⁺)	ABC	3310.6 [@] 9	(15 ⁺)	AB	5696.5 ^a 10	(20 ⁺)	B
2089.4 ^b 10	(12 ⁻)	AB	3373.5 ^g 11	(15 ⁻)	B			

[†] From least-squares fit to E_γ's, assuming Δ(E_γ)=0.5 keV for E_γ's quoted to tenth of a keV and 1 keV for others, when not stated.

[‡] As proposed by 1997Ha29 in (¹¹B,3n_γ), 2003Ko23 in (⁶Li,4n_γ) and 2003Ra28 and 2003Ra48 in (¹³C,4np_γ) reactions based on γγ(θ)(DCO) and γ(lin pol) measurements; band assignments and comparison with systematics and calculations, unless otherwise stated. The L-transfer in (d,t) is from 7/2⁺ target.

[#] Band(A): πh_{11/2}νh_{11/2}, α=0.

[@] Band(a): πh_{11/2}νh_{11/2}, α=1.

[&] Band(B): Probable Chiral partner of πh_{11/2}νh_{11/2}.

^a Band(C): πg_{7/2}⊗ν(g_{7/2}h_{11/2}²).

^b Band(D): πh_{11/2}νd_{5/2}, α=0.

^c Band(d): πh_{11/2}νd_{5/2}, α=1.

^d Band(E): πh_{11/2}νg_{7/2}, α=0.

^e Band(e): πh_{11/2}νg_{7/2}, α=1.

^f Band(F): πh_{11/2}⊗ν(d_{5/2}h_{11/2}²).

^g Band(G): Band based on 15⁻.

γ(¹³²Cs)

E _i (level)	J ^π _i	E _γ [†]	E _f	J ^π _f
86.2	(3 ⁺)	86.2	0	2 ⁺
108.3	(4 ⁺)	22.1	86.2	(3 ⁺)
		108.3	0	2 ⁺
183.6	(4 ⁺)	97.3	86.2	(3 ⁺)
185.9	(5)	77.6	108.3	(4 ⁺)
240.1	(5 ⁻)	54.1	185.9	(5)
		56.4	183.6	(4 ⁺)
		131.9	108.3	(4 ⁺)
311.7	(7 ⁻)	71.6	240.1	(5 ⁻)

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Adopted Levels, Gammas (continued)

$\gamma(^{132}\text{Cs})$ (continued)								
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. ‡	$\delta^\#$	Comments
379.3	(8 ⁻)	67.6 3	100	311.7	(7 ⁻)			
537.6	(8 ⁻)	225.9 3	100	311.7	(7 ⁻)	M1+E2		
787.8	(9 ⁻)	408.5 3	100	379.3	(8 ⁻)	M1+E2		
980.0	(9 ⁻)	442.4 3	96 7	537.6	(8 ⁻)			
		668.3 3	100 11	311.7	(7 ⁻)	Q		
1081.5	(10 ⁻)	293.7 4	8.6 16	787.8	(9 ⁻)			
		702.2 2	100 3	379.3	(8 ⁻)	E2		
1131.3	(9 ⁺)	343.6 3	22.6 11	787.8	(9 ⁻)	E1		
		593.8 2	100.0 23	537.6	(8 ⁻)	E1		
1214.7	(10 ⁻)	234.7 4	38 5	980.0	(9 ⁻)			
		677.1 4	100 12	537.6	(8 ⁻)	Q		
1281.9	(10 ⁺)	150.5 3	100 3	1131.3	(9 ⁺)	D(+Q)	+0.03 6	
		494.1 3	18.2 7	787.8	(9 ⁻)	E1		
1474.6	(11 ⁻)	393.1 4	100 5	1081.5	(10 ⁻)	M1+E2		
		686.8 3	37 5	787.8	(9 ⁻)	Q		
1683.5	(11 ⁺)	401.6 3	100	1281.9	(10 ⁺)	M1(+E2)	-0.08 +7-8	
1729.2	(10 ⁺)	447.3 4	100	1281.9	(10 ⁺)	D+Q		
1826.1	(11 ⁻)	611.3 3	95 8	1214.7	(10 ⁻)	M1+E2		
		846.1 4	100 9	980.0	(9 ⁻)	E2		
1835.2	(11 ⁺)	553.3 4	71.4 11	1281.9	(10 ⁺)	M1+E2		
		703.8 2	100 3	1131.3	(9 ⁺)	E2		
1891.2	(11 ⁺)	162.0 6	25 7	1729.2	(10 ⁺)	D+Q		
		609.3 4	100 5	1281.9	(10 ⁺)	M1+E2		
		759.8 5	19 6	1131.3	(9 ⁺)			
1933.9	(12 ⁻)	459.3 5	32 6	1474.6	(11 ⁻)			
		852.4 3	100 6	1081.5	(10 ⁻)	E2		
1982.0	(12 ⁺)	146.8 3	48 2	1835.2	(11 ⁺)			
		298.5 4	29 3	1683.5	(11 ⁺)	M1+E2		
		700.1 4	100 3	1281.9	(10 ⁺)	E2		
1987.9	(12 ⁺)	152.7 4	100.0 24	1835.2	(11 ⁺)			
		304.4 4	40.4 24	1683.5	(11 ⁺)	M1+E2		
		706.0 4	63 4	1281.9	(10 ⁺)	E2		I_γ : other: 134 7 in ($^6\text{Li}, 4n\gamma$).
2089.4	(12 ⁻)	263.3 6	42 10	1826.1	(11 ⁻)			
		874.6 3	100 12	1214.7	(10 ⁻)	E2		
2201.6	(12 ⁺)	310.3 4	100 9	1891.2	(11 ⁺)	M1+E2		
		518.0 4	61 11	1683.5	(11 ⁺)	M1+E2		
2316.0	(13 ⁻)	382.1 4	44 5	1933.9	(12 ⁻)	D+Q		
		841.5 2	100 5	1474.6	(11 ⁻)	E2		
2368.7	(13 ⁺)	167.2 3	61 6	2201.6	(12 ⁺)	D+Q		I_γ : other: 123 36 in ($^6\text{Li}, 4n\gamma$).
		386.7 4	100 9	1982.0	(12 ⁺)	D+Q		
2395.7	(14 ⁺)	407.8 3	100.0 20	1987.9	(12 ⁺)	E2		
		413.7 4	29.3 15	1982.0	(12 ⁺)	E2		
2410.0	(13 ⁺)	422.1 3	51.9 20	1987.9	(12 ⁺)			
		428.0 3	100 5	1982.0	(12 ⁺)	M1+E2		
		726.5 4	31 5	1683.5	(11 ⁺)	Q		
2515.4	(13 ⁺)	313.8 5	100	2201.6	(12 ⁺)	D+Q		
2636.0	(13 ⁻)	546.6 4	100 18	2089.4	(12 ⁻)	M1+E2		
		702.1 3	80 15	1933.9	(12 ⁻)			
2772.8	(14 ⁻)	136.7 4	100	2636.0	(13 ⁻)	M1+E2		
		785.3		1987.9	(12 ⁺)			E_γ : from ($^{11}\text{B}, 3n\gamma$) only.
2865.1	(14 ⁺)	455.1 5	34 7	2410.0	(13 ⁺)	M1+E2		
		496.4 2	90 9	2368.7	(13 ⁺)	M1+E2		
		883.1 3	100 8	1982.0	(12 ⁺)	E2		
2868.5	(14 ⁻)	552.5 [@] 2	18 9	2316.0	(13 ⁻)			
		934.6 5	100 21	1933.9	(12 ⁻)	Q		

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Adopted Levels, Gammas (continued)

$\gamma(^{132}\text{Cs})$ (continued)							
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. [‡]	Comments
2893.6	(14 ⁺)	378.2 4	74 17	2515.4	(13 ⁺)	D+Q	
		483.6 3	100 21	2410.0	(13 ⁺)	M1+E2	
2909.7	(14 ⁺)	541.0 3	100	2368.7	(13 ⁺)	M1+E2	
2988.7	(15 ⁻)	215.9 3	100	2772.8	(14 ⁻)	M1+E2	
3028.9	(15 ⁺)	633.3 4	100	2395.7	(14 ⁺)	D+Q	
3165.3?		1076 @	100	2089.4	(12 ⁻)		
3232.0	(15 ⁻)	243.3 4	27 4	2988.7	(15 ⁻)		
		363.5 6	23 4	2868.5	(14 ⁻)	M1+E2	
		916.0 3	100 8	2316.0	(13 ⁻)	Q	
3270.9	(16 ⁻)	281.9 3	100	2988.7	(15 ⁻)	M1+E2	
3310.6	(15 ⁺)	445.5 4	100 5	2865.1	(14 ⁺)	M1+E2	
		900.6 4	77 8	2410.0	(13 ⁺)	E2	
3373.5	(15 ⁻)	1057.4 4	100	2316.0	(13 ⁻)	E2	
3389.5	(16 ⁺)	360.6 2	11.5 19	3028.9	(15 ⁺)		E_γ : from (¹³ C,4np γ) only.
		993.8 3	100 3	2395.7	(14 ⁺)	E2	
3585.9	(16 ⁻)	212.4 4	100 19	3373.5	(15 ⁻)		
		353.8 5	81 16	3232.0	(15 ⁻)	D+Q	
3665.7	(17 ⁻)	395.1 3	100	3270.9	(16 ⁻)	M1+E2	
3759.1	(17 ⁺)	730.2 3	100	3028.9	(15 ⁺)		
3788.7	(16 ⁺)	478.0 4	52 10	3310.6	(15 ⁺)	D+Q	
		923.6 4	100 17	2865.1	(14 ⁺)	E2	
3985.6	(17 ⁻)	399.7 5	72 11	3585.9	(16 ⁻)	D+Q	
		753.6 3	100 8	3232.0	(15 ⁻)	E2	
4172.8	(18 ⁻)	507.1 2	100	3665.7	(17 ⁻)	M1+E2	
4187.0	(17 ⁻)	955.0 5	100	3232.0	(15 ⁻)		
4241.5	(17 ⁺)	452.9 5	59 11	3788.7	(16 ⁺)	M1+E2	
		930.9 4	100 8	3310.6	(15 ⁺)	E2	
4386.3	(18 ⁺)	996.8 3	100	3389.5	(16 ⁺)	E2	
4487.4	(18 ⁻)	501.8 2	100	3985.6	(17 ⁻)	D+Q	
4665.5	(18 ⁺)	424.0 4	85 15	4241.5	(17 ⁺)		
		876.9 4	100 30	3788.7	(16 ⁺)	Q	
4755.9	(19 ⁻)	583.1 4	100	4172.8	(18 ⁻)	M1+E2	
4943.7	(19 ⁻)	456.3 3	100	4487.4	(18 ⁻)		
5073.6	(19 ⁺)	832.1 3	100	4241.5	(17 ⁺)	Q	
5212.4		826.1 4	100	4386.3	(18 ⁺)		
5423.6	(20 ⁻)	667.7 3	100	4755.9	(19 ⁻)		
5696.5	(20 ⁺)	1310.2 3	100	4386.3	(18 ⁺)	Q	

[†] Above 380 level, most values are from (¹³C,4npγ). For low-lying levels, values are from [1997Ha29](#).

[‡] From γγ(θ) and γ(lin pol); mult=Q corresponds to ΔJ=2 and D+Q to ΔJ=0 or 1 from γγ(θ) data only. [2003Ra48](#) assign E2 and M1/E2, respectively to these transitions.

[#] From γγ(θ) in (⁷Li,4nγ).

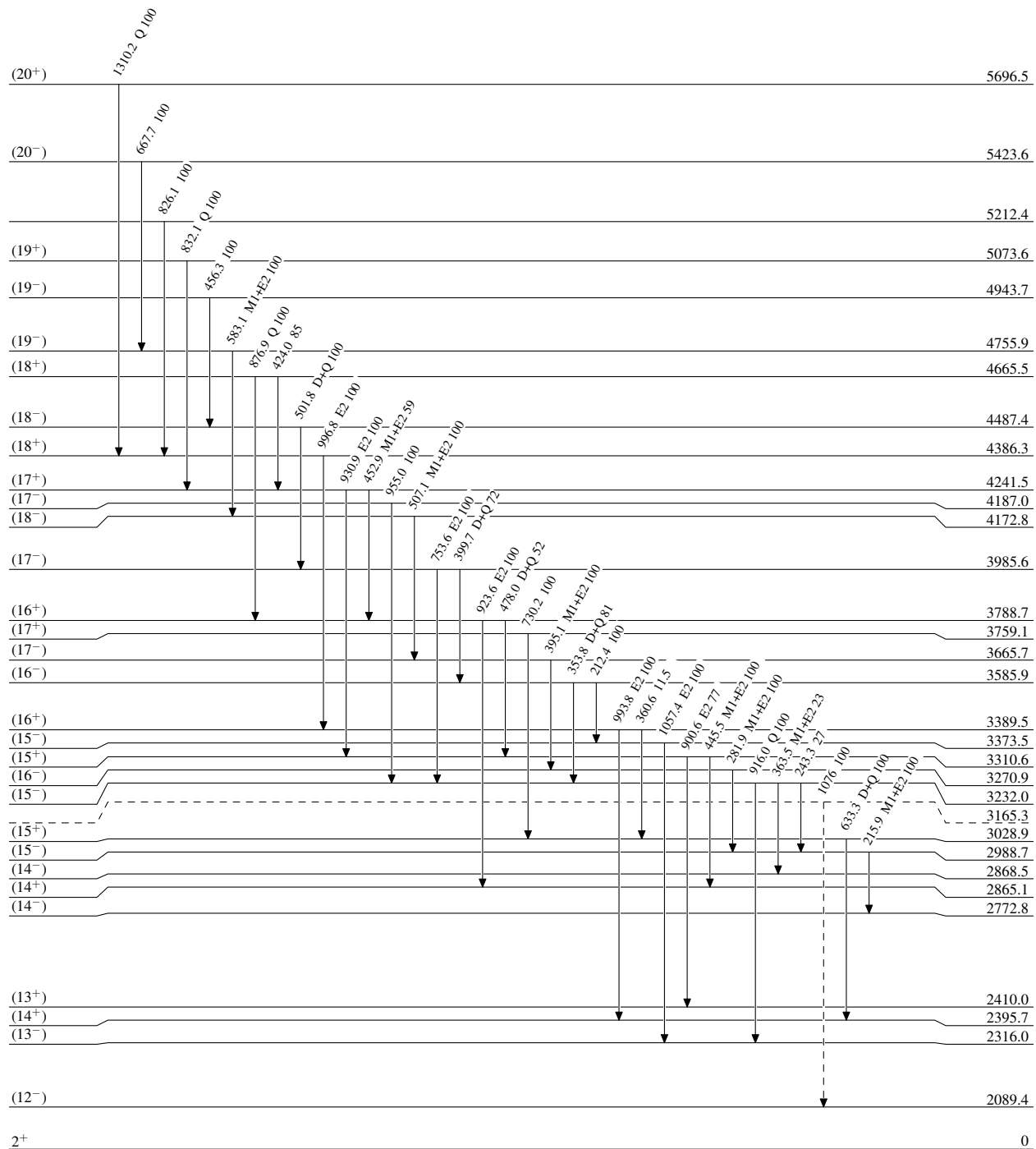
@ Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)


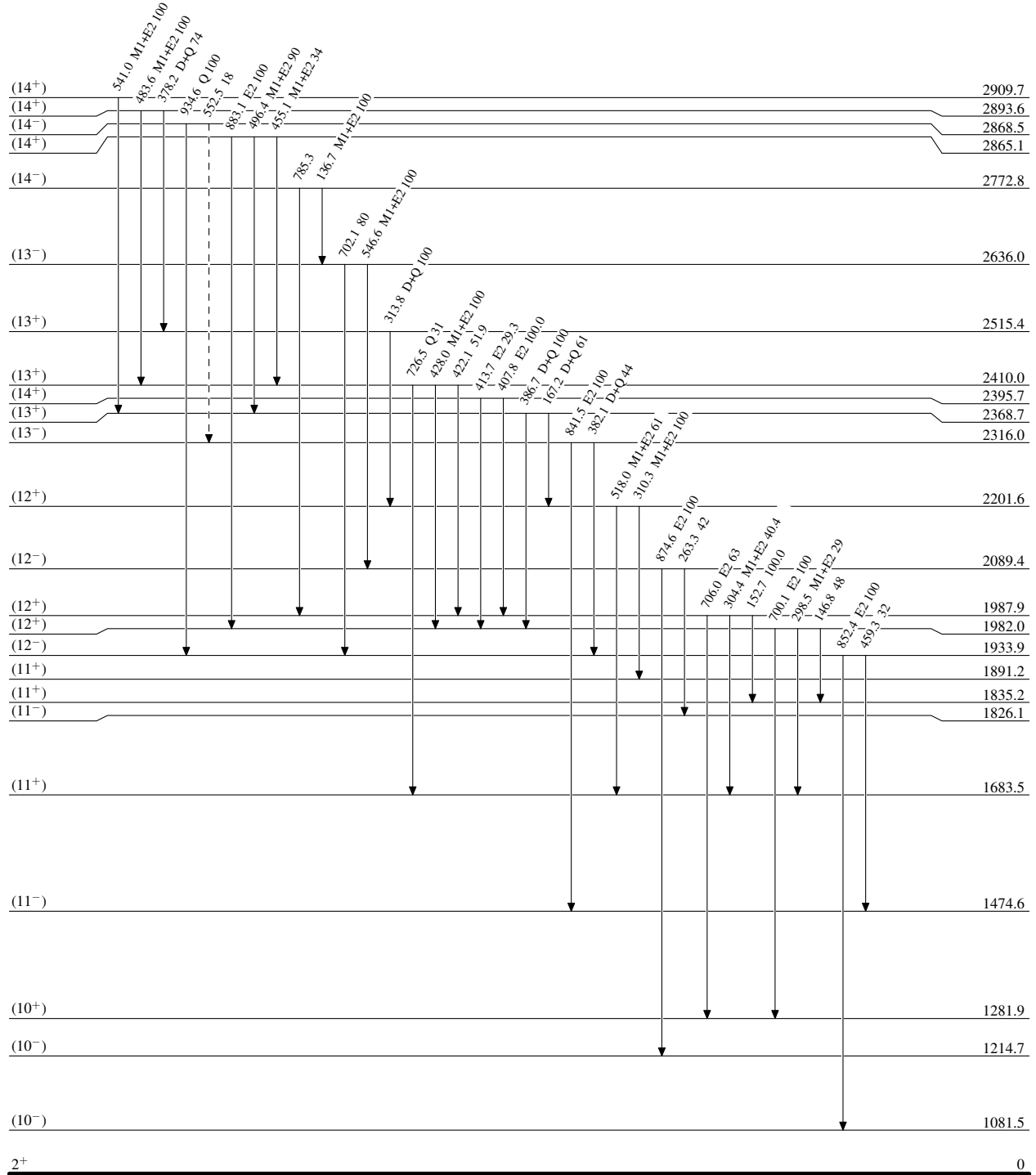
6.480 d 6

Adopted Levels, Gammas

Legend

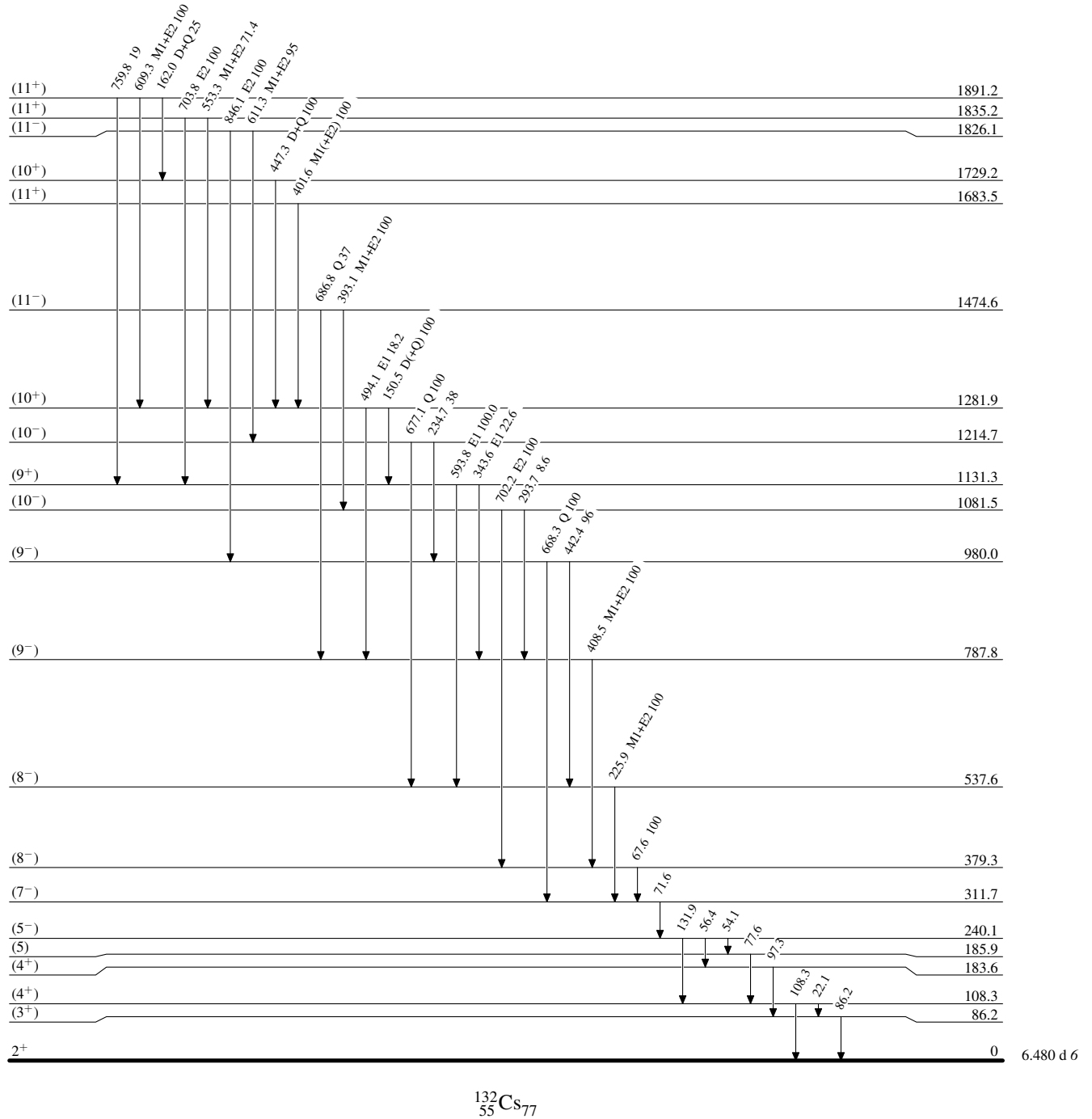
Level Scheme (continued)

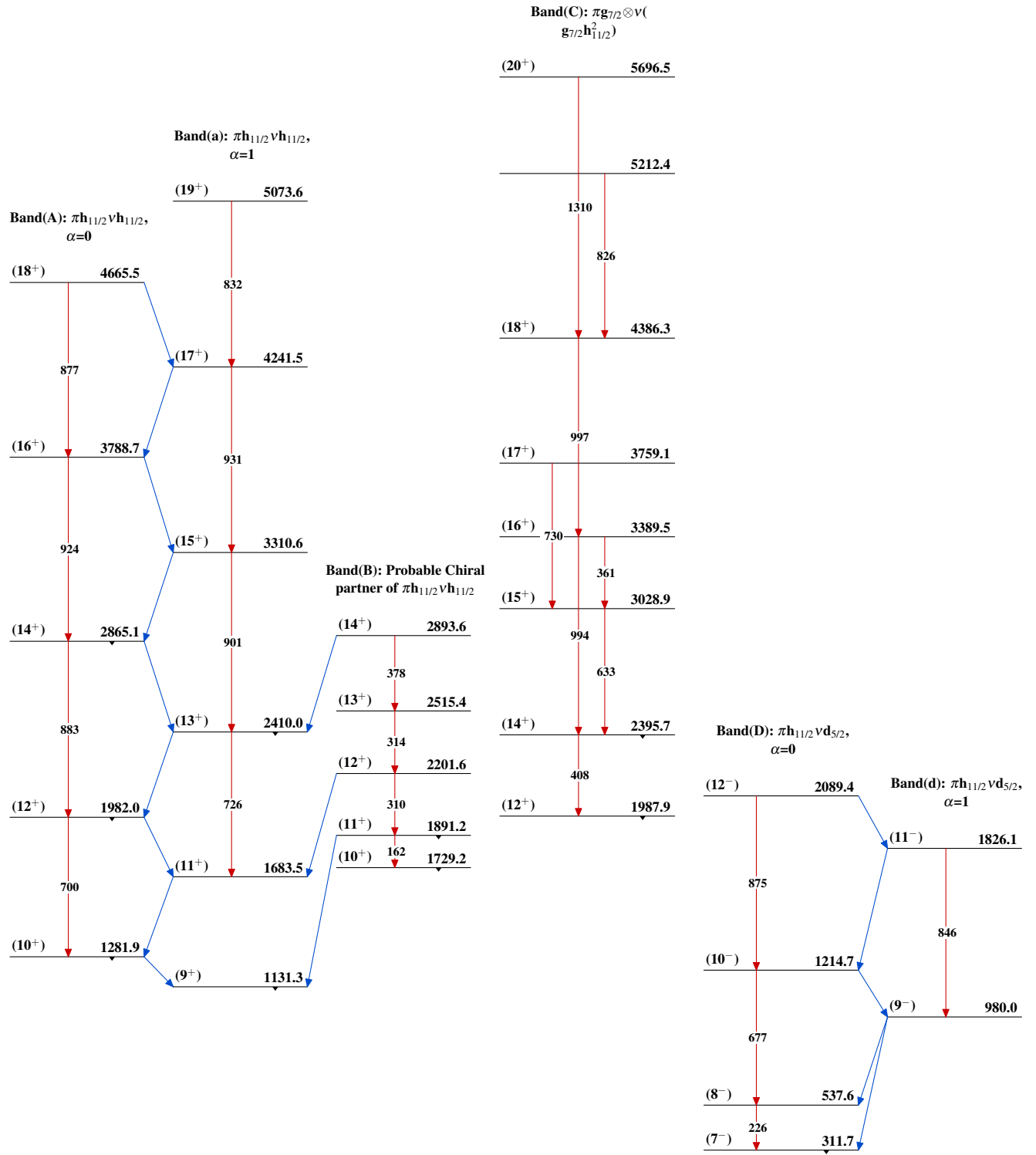
Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Adopted Levels, Gammas (continued)