^{140}Ce(n,n′γ) 1993Go23,1985Di11

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

1993Go23: reactor fast neutrons, measured γ(θ) at seven angles, linear polarization, $T_{1/2}$.

Others:
Reactor fast neutrons (1985Di11); E=1.75 MeV (1993Be03), E=2.75 MeV (1969Ro13); see also 1965Tu03.
Measured: γ (1985Di11,1969Ro13), γ(θ) (1985Di11,1993Be03), $T_{1/2}$ (1993Be03).
2001Ch03: measured σ(E) E=0.5-10 MeV and σ(θ) on g.s. (E=7.5 MeV) and first excited 2^+, 4^+, and 3-states.
There is a good general agreement in between 1993Go23 and 1985Di11.
Most data and level scheme are from 1993Go23.

^{140}Ce Levels

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
0.0	0^+		
1596.217 *15*	2^+	0.076[@] ps *+28−21*	
1903.079 *25*	0^+		
2083.224 *25*	4^+		
2107.83 *4*	6^+		no explicit γ transitions deexcite this level.
2347.890 *25*	2^+	≥0.62 ns	
2349.76 *3*	5^+		
2412.040 *5*	3^+	≥1.1 ns	
2464.092 *25*	3^-		
2480.89 *5*	4^+		
2515.82 *25*	4^+	>0.62 ps	
2521.433 *25*	2^+	≥0.62 ns	
2547.219 *25*	1^+	0.19 ns *+11−5*	
2628.80 *5*	6^+		
2659?			E(level): seems uncertain if this level was observed or not by 1993Go23.
2899.58 *4*	2^+	0.049 ns *8*	
3001.23 *4*	2^+	0.16 ns *+10−5*	
3016.78 *8*	0^+	≥0.14 ns	
3039.0 *4*			
3118.52 *4*	2^+	0.019 ns *3*	
3120.34 *20*	2^+		Extra 2^+ level found only by 1985Di11 about 2 keV higher in energy than the previous 2^+, 3118.5 level found only by 1993Go23, both levels being mainly determined by a γ transition to g.s., which suggests that this can be a same level.
3122.09 *5*	4^+,(2)		Jπ: (2) if 1526γ is D+Q, ΔJ=0; 772.5γ to 5^+ makes this possibility less likely.
3219.93 *10*	(0^+)		Jπ: postulated by 1993Go23 based on expected intensity rules.
3255.66 *6*	$3^{(-)}$,$5^{(-)}$		
3319.65 *6*	2^+	0.058 ns *+19−12*	
3335.35 *13*	4^+		
3360.21 *19*			
3391.03 *10*			
3394.87 *7*	(4^-)	0.042 ns *+49−21*	
3408.1 *4*	(2^+)	≥0.062 ns	Jπ: assigned by 1993Go23 as $(1,2^+)$ from γ to 0^+ g.s.; γ′s to 3^+ and 3^- likely to exclude J=1.
3425.15 *16*	7^-		
3436.53 *6*			
3471.19 *11*	$(1,2^+)$	0.097 ns *+76−35*	
3473.73 *5*	3^-	0.066 ns *+21−13*	
3491.2? *7*			E(level): uncertain level by 1993Go23 due to relatively small population.
3539.1 *3*	2^+	≥0.21 ns	
3567.1 *10*	(2^+)		

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^{140}Ce(n,n′γ) 1993Go23,1985Di11 (continued)

^{140}Ce Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
3642.6 *3*	1^-	≤0.0017 ns	
3646.6 *6*	$(1,2^+)$	≥0.062 ns	
3648.21 *7*			
3657.52? *10*			E(level): uncertain level by 1993Go23 due to relatively small population.
3684.1 *6*			
3708.5 *2*	(2^+)		
3723.86 *24*	2^+	≥0.097 ns	
3735.2 *4*	$(1,2^+)$		
3768.05 *13*			
3792.85 *5*	3^-		
3836.0? *5*			
3847.1 *2*			
3853.3 *6*	$(1,2^+)$		
3879.1 *9*	$(1,2^+)$		
3910.95 *25*			
3958.0 *3*			
3984.16 *16*	(2,3,4)		
4164.0 *4*	$(1,2^+)$		
4170.8 *10*	(2^+)		
4279.8 *4*	$(3,4^+)$		

[†] From 1993Go23.
[‡] Assigned by 1993Go23 based on measured multipolarities and intensity rules. More specific arguments of the authors or evaluator are given in comments.
[#] From 1993Go23 (DSAM) unless noted otherwise.
[@] From 1993Be03 (DSAM).

γ(^{140}Ce)

Unplaced γ′s are from 1993Go23 unless noted otherwise.
ΔE: Uncertainty not given by 1993Go23.

Eγ	Iγ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
69.4 *5*		2480.89	4^+	2412.040	3^+			
131.13 *3*	2.66 *24*	2480.89	4^+	2349.76	5^+	(M1+E2)	+0.071 *16*	A_2=−0.17 *3*; A_4=+0.04 *4* (1993Go23) δ: also −35 *+40−12* (1993Go23).
[x]165.85 *13*	0.108 *12*							
[x]169.13 *22*	0.034 *9*							
[x]171.1 *3*	0.029 *10*							
[x]177.4 *3*	0.024 *8*							
[x]181.4 *3*	0.031 *9*							
[x]202.4 *3*	0.029 *9*							
241.938 *8*	3.91 *20*	2349.76	5^+	2107.83	6^+	M1		A_2=−0.102 *11*; A_4=+0.018 *16* (1993Go23) Mult.,δ: based on γ(θ) and lin pol 1993Go23 conclude ΔJ=1, pure M1; if M1(+E2), δ=−0.19 *10* (1993Go23), δ=−0.04 *+3−6* (1985Di11). pol=0.70 *+8−16* (1993Go23).
[x]255.19 *16*	0.014 *6*							
266.533 *20*	4.28 *21*	2349.76	5^+	2083.224	4^+	M1		A_2=−0.329 *24*; A_4=−0.03 *4* (1993Go23)

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^{140}Ce(n,n′γ) 1993Go23,1985Di11 (continued)

γ(^{140}Ce) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ‡	Comments
								Mult.,δ: based on γ(θ) and lin pol 1993Go23 conclude ΔJ=1, pure M1; if M1(+E2), δ=−0.069 *15* (1993Go23), δ=−0.04 *4* (1985Di11). Note that in ^{140}La β decay (1982Mi03) δ=+20 *+43−8*. A_2=−0.31 *6*, A_4=+0.01 *8* (1985Di11). pol=0.67 *+8−13* (1993Go23).
278.84 *13*	0.123 *15*	2628.80	6^+	2349.76	5^+			
306.862 *20*	2.46 *12*	1903.079	0^+	1596.217	2^+	E2		A_2=+0.000 *12*; A_4=0.0 (1993Go23) A_2=0, A_4=0 (1985Di11).
328.740 *20*	3.21 *16*	2412.040	3^+	2083.224	4^+	M1+E2	+0.19 *4*	A_2=−0.27 *3*; A_4=−0.14 *5* (1993Go23) pol=0.83 *+10−15* (1993Go23). δ: also +13 *+11−5* (1993Go23).
397.68 *7*	0.252 *15*	2480.89	4^+	2083.224	4^+	(M1+E2)@	+0.5 *+3−4*	A_2=+0.41 *8*; A_4=−0.01 *10* (1993Go23)
x410.59	0.101 *11*							
432.497 *20*	2.58 *13*	2515.82	4^+	2083.224	4^+	M1+E2@	−0.04 *2*	A_2=+0.294 *12*; A_4=+0.033 *17* (1993Go23) A_2=+0.23 *4*, A_4=−0.00 *5* (1985Di11). pol=1.8 *3* (1993Go23).
487.006 *17*	33.5 *17*	2083.224	4^+	1596.217	2^+	E2		A_2=+0.190 *12*; A_4=−0.057 *17* (1993Go23) pol=1.54 *19* (1993Go23).
520.964 *25*	0.97 *5*	2628.80	6^+	2107.83	6^+	E2+M1@	−0.19 *4*	A_2=+0.292 *25*; A_4=−0.02 *3* (1993Go23) δ: other value: +0.78 *15* (1985Di11). A_2=+0.28 *5*, A_4=−0.03 *6* (1985Di11). pol=2.3 *5* (1993Go23).
575[a]		2659?		2083.224	4^+			E_γ: seems uncertain if this transition was observed or not by 1993Go23.
x638.9 *4*	0.049 *13*							
x651.21 *19*	0.040 *6*							
657.5 *4*	0.024 *8*	3122.09	4^+,(2)	2464.092	3^-			
x662.01† *5*	1.2 *1*							
x679.3 *10*	0.030 *10*							
x699.46 *13*	0.077 *10*							
x716.4 *3*	0.070 *12*							
x730.5 *4*	0.014 *6*							
x734.1 *3*	0.023 *9*							
739.94 *4*	0.360 *21*	3255.66	$3^{(-)}$,$5^{(-)}$	2515.82	4^+	(E1)		A_2=−0.23 *3*; A_4=+0.05 *5* (1993Go23) Mult.: stretched dipole based on γ(θ) more likely electric based on lin pol (by evaluator). pol=1.4 *5* (1993Go23).
x740.0† *1*	0.3 *1*							

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^{140}Ce(n,n′γ) 1993Go23,1985Di11 (continued)

γ(^{140}Ce) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ‡	Comments
751.665 *20*	5.4 *3*	2347.890	2^+	1596.217	2^+	M1+E2@	+0.31 *+34−14*	A_2=+0.283 *12*; A_4=−0.009 *17* (1993Go23) A_2=+0.030 *3*, A_4=+0.05 *4* (1985Di11). pol=1.12 *+12−18* (1993Go23). δ: from 1985Di11. Other values: +0.5 *+6−2* (1993Go23); +1.15 *+33−25* (1985Di11).
x754.11 *16*	0.057 *12*							
x768.6 *4*	0.029 *9*							
772.50& *13*	0.189& *16*	3122.09	4^+,(2)	2349.76	5^+			
772.50&a *13*	0.189& *16*	3319.65	2^+	2547.219	1^+			
774.8 *3*	0.080 *13*	3255.66	$3^{(-)}$,$5^{(-)}$	2480.89	4^+			
x788.3 *4*	0.031 *9*							
808.1 *3*	0.072 *11*	3847.1		3039.0				
815.800 *20*	3.86 *19*	2412.040	3^+	1596.217	2^+	M1(+E2)	−0.056 *12*	A_2=−0.239 *10*; A_4=−0.025 *16* (1993Go23) δ: other value: −0.06 *+3−2* (1985Di11). A_2=−0.26 *1*, A_4=+0.03 *2* (1985Di11). pol=0.54 *+9−12* (1993Go23).
x819.53 *10*	0.324 *21*							
x832.1 *3*	0.36 *6*							
855.1 *4*	0.044 *11*	3335.35	4^+	2480.89	4^+			
867.874 *20*	6.5 *3*	2464.092	3^-	1596.217	2^+	E1		A_2=−0.20 *4*; A_4=−0.07 *4* (1993Go23) pol=2.1 *4* (1993Go23).
x884.5 *5*	0.041 *13*							
x886.3† *2*								
886.42 *22*	0.136 *15*	3408.1	(2^+)	2521.433	2^+			
893.7 *3*	0.094 *12*	3792.85	3^-	2899.58	2^+			
x904.0 *3*	0.038 *9*							
x917.51 *19*	0.21 *3*							
919.502 *20*	2.57 *13*	2515.82	4^+	1596.217	2^+	E2		A_2=+0.294 *12*; A_4=+0.033 *17* (1993Go23) A_2=+0.22 *5*, A_4=−0.13 *7* (1985Di11). pol=1.8 *+4−3* (1993Go23).
x922.68 *16*	0.119 *13*							
925.213 *20*	2.59 *13*	2521.433	2^+	1596.217	2^+	M1+E2@	−0.17 *2*	A_2=+0.047 *18*; A_4=−0.04 *3* (1993Go23) δ: other value: +5.1 *5* (1985Di11). A_2=+0.04 *1*, A_4=−0.04 *1* (1985Di11). pol=1.20 *+20−25* (1993Go23).
x938.6 *4*	0.055 *11*							
944.0& *3*	0.056& *10*	3408.1	(2^+)	2464.092	3^-			
944.0& *3*	0.056& *10*	3491.2?		2547.219	1^+			
950.999 *20*	2.21 *11*	2547.219	1^+	1596.217	2^+	M1+E2	−0.10 *12*	A_2=−0.005 *18*; A_4=0.0 (1993Go23) A_2=+0.02 *6*, A_4=+0.05 *8* (1985Di11). pol=0.86 *+14−21* (1993Go23).

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^{140}Ce(n,n′γ) 1993Go23,1985Di11 (continued)

γ(^{140}Ce) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ‡	Comments
x968.36 22	0.089 12							
x975.5 3	0.073 11							
982.89a	0.404 23	3394.87	(4⁻)	2412.040	3⁺			
985.63 22	0.023 7	3335.35	4⁺	2349.76	5⁺			
996.2& 3	0.037& 9	2899.58	2⁺	1903.079	0⁺			
996.2& 3	0.037& 9	3408.1	(2⁺)	2412.040	3⁺			
x1000.1 3	0.028 10							
x1004.42 22	0.070 12							
1010.45 19	0.166 17	3360.21		2349.76	5⁺			
x1032.57 22	0.095 12							
1045.11 7	0.299 19	3394.87	(4⁻)	2349.76	5⁺			A_2=+0.14 5; A_4=0.0 (1993Go23)
1088.65 6	0.76 4	3436.53		2347.890	2⁺			
x1088.77† 6	0.9 1							
1097.27 4	0.82 4	3001.23	2⁺	1903.079	0⁺			
x1105.6 3	0.057 11							
x1113.84 13	0.207 16							
x1117.1 4	0.031 9							
x1121.68 22	0.099 13							
1125.64 22	0.097 13	3473.73	3⁻	2347.890	2⁺			
x1135.24 16	0.249 16							
x1172.61 13	0.180 15							
x1177.7 3	0.125 15							
x1184.7 4	0.037 11							
x1198.14 13	0.276 24							
1220.5&a 3	0.085& 12	3684.1		2464.092	3⁻			
1220.5& 3	0.085& 12	3768.05		2547.219	1⁺			
1227.71&a 16	0.106& 13	3335.35	4⁺	2107.83	6⁺			
1227.71& 16	0.106& 13	3708.5	(2⁺)	2480.89	4⁺			
x1232.8† 1	0.6 1							
x1232.87 7	0.55 3							
1235.8a 6	0.055 17	3319.65	2⁺	2083.224	4⁺			
1252.12& 13	0.245& 19	3335.35	4⁺	2083.224	4⁺			
1252.12&a 13	0.245& 19	3768.05		2515.82	4⁺			
x1258.73 19	0.251 22							
x1266.83 16	0.145 16							
1276.9& 4	0.045& 13	3360.21		2083.224	4⁺			
1276.9&	0.045& 13	3792.85	3⁻	2515.82	4⁺			
x1282.8† 1	0.4 1							
x1282.85 10	0.351 22							
1287.03& 19	0.090& 13	3394.87	(4⁻)	2107.83	6⁺			
1287.03& 19	0.090& 13	3768.05		2480.89	4⁺			
1303.38 5	0.61 3	2899.58	2⁺	1596.217	2⁺	M1+E2@	−1.5 +10−4	A_2=+0.21 3; A_4=+0.01 5 (1993Go23) pol=1.0 5 (1993Go23).
1307.73& 10	0.219& 17	3391.03		2083.224	4⁺			
1307.73&a 10	0.219& 7	3657.52?		2349.76	5⁺			
1311.56&a 19	0.088& 13	3394.87	(4⁻)	2083.224	4⁺			
1311.56& 19	0.088& 13	3723.86	2⁺	2412.040	3⁺			
1311.56&	0.088& 13	3792.85	3⁻	2480.89	4⁺			
1317.28 16	0.131 15	3425.15	7⁻	2107.83	6⁺			
x1320.8 3	0.053 15							
x1347.1 4	0.090 17							

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^{140}Ce(n,n′γ) 1993Go23,1985Di11 (continued)

γ(^{140}Ce) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ‡	Comments
x1350.5 *4*	0.043 *14*							
x1354.73 *19*	0.139 *17*							
x1368.7 *3*	0.030 *11*							
x1399.8 *16*	0.026 *17*							
x1401.91 *19*	0.163 *18*							
1405.01 *3*	1.36 *7*	3001.23	2^+	1596.217	2^+	E2+M1@	+0.7 *3*	A_2=+0.318 *25*; A_4=−0.06 *3* (1993Go23) A_2=+0.28 *7*, A_4=−0.09 *9* (1985Di11). pol=4.5 *+70−20* (1993Go23).
1420.55 *7*	0.324 *21*	3016.78	0^+	1596.217	2^+	(E2)		A_2=−0.04 *4*; A_4=+0.01 *6* (1993Go23)
x1426.0 *4*	0.083 *13*							
x1438.2 *3*	0.056 *10*							
x1443.11 *22*	0.066 *11*							
x1471.76 *22*	0.064 *9*							
x1475.3 *3*	0.085 *11*							
1484.3 *3*	0.067 *9*	3567.1	(2^+)	2083.224	4^+			
1493.6 *3*	0.094 *12*	3958.0		2464.092	3^-			
1497.31 *22*	0.148 *15*	3847.1		2349.76	5^+			
1522.0 *4*	0.075 *13*	3118.52	2^+	1596.217	2^+			
1525.85 *4*	0.82 *4*	3122.09	4^+,(2)	1596.217	2^+	E2		A_2=+0.21 *3*; A_4=−0.13 *5* (1993Go23) pol=3.5 *+50−18* (1993Go23).
x1526.0† *1*	0.8 *1*							
1533.2a *4*	0.047 *8*	3436.53		1903.079	0^+			
x1539.4 *3*	0.055 *10*							
x1545.2 *4*	0.017 *8*							
1549.76 *19*	0.099 *10*	3657.52?		2107.83	6^+			
x1554.04 *16*	0.081 *9*							
1564.92 *16*	0.199 *16*	3648.21		2083.224	4^+			
1568.1 *5*	0.058 *13*	3471.19	$(1,2^+)$	1903.079	0^+			
x1570.1 *10*	0.031 *11*							
1574.5 *5*	0.026 *9*	3657.52?		2083.224	4^+			
x1584.3 *4*	0.05 *2*							
1596.207 *15*	100	1596.217	2^+	0.0	0^+	E2		A_2=+0.247 *12*; A_4=−0.069 *17* (1993Go23) A_2=+0.20 *1*, A_4=−0.09 *1* (1985Di11). pol=2.3 *+12−6* (1993Go23).
x1619.88 *13*	0.199 *15*							
1623.71 *10*	0.284 *18*	3219.93	(0^+)	1596.217	2^+			
x1632.6 *3*	0.074 *10*							
x1635.8 *3*	0.093 *11*							
x1641.8 *3*	0.120 *12*							
x1650.7 *3*	0.073 *9*							
1684.4 *3*	0.058 *8*	3768.05		2083.224	4^+			
x1691.5† *2*	0.4 *1*							
x1692.59 *16*	0.181 *13*							
x1697.0 *3*	0.035 *6*							
x1701.61 *16*	0.092 *9*							
x1719.3 *4*	0.024 *6*							
1724.7a	0.248 *16*	3319.65	2^+	1596.217	2^+			
1739.4& *3*	0.056& *9*	3335.35	4^+	1596.217	2^+			
1739.4&a *3*	0.056& *9*	3642.6	1^-	1903.079	0^+			
1739.4& *3*	0.056& *9*	3847.1		2107.83	6^+			
1743.31a *22*	0.057 *8*	3646.6	$(1,2^+)$	1903.079	0^+			
1753.1a *4*	0.019 *6*	3836.0?		2083.224	4^+			
x1755.9 *5*	0.014 *6*							
1763.6 *3*	0.069 *9*	3847.1		2083.224	4^+			

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^{140}Ce(n,n′γ) 1993Go23,1985Di11 (continued)

γ(^{140}Ce) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	Comments
x1785.16 19	0.167 13						
1794.93 10	0.173 12	3391.03		1596.217	2+		
1811.0a 3	0.066 10	3408.1	(2+)	1596.217	2+		
x1812.7 4	0.046 9						
x1817.3 4	0.010 5						
x1859.0 4	0.036 9						
x1864.3 5	0.029 8						
1877.51 3	0.45 4	3473.73	3−	1596.217	2+		A_2=+0.005 22; A_4=−0.06 3 (1993Go23)
x1879.7 4	0.023 10						
x1883.9 4	0.033 8						
x1891.6 4	0.045 9						
x1898.6 4	0.061 11						
1901.4 5	0.046 10	3984.16	(2,3,4)	2083.224	4+		
x1911.1 4	0.102 12						
x1927.7 5	0.044 9						
x1982.0 3	0.081 11						
x2014.1 5	0.040 10						
x2047.7 16	0.047 11						
2052.07 22	0.137 13	3648.21		1596.217	2+		
x2074.0 4	0.033 8						
x2090.1 7	0.033 10						
2112.30 19	0.131 11	3708.5	(2+)	1596.217	2+		
x2145.04 19	0.090 9						
x2165.8 3	0.080 9						
2171.82 13	0.249 16	3768.05		1596.217	2+		
x2180.6 4	0.067 9						
2196.6& 6	0.087& 9	3792.85	3−	1596.217	2+		
2196.6& 4	0.087& 9	4279.8	(3,4+)	2083.224	4+		
2239.8 5	0.060 10	3836.0?		1596.217	2+		
x2253.3 3	0.120 12						
2256.8 7	0.039 11	3853.3	(1,2+)	1596.217	2+		
x2278.1 5	0.029 9						
2314.68 22	0.085 10	3910.95		1596.217	2+		
x2328.0 5	0.030 8						
x2339.9 5	0.032 7						
2347.89 5	0.96 5	2347.890	2+	0.0	0+	E2	A_2=+0.225 24; A_4=−0.13 3 (1993Go23)
x2353.30 26	0.118 12						
2361.80 22	0.136 12	3958.0		1596.217	2+		
x2368.6 4	0.053 8						
2387.90 16	0.053 8	3984.16	(2,3,4)	1596.217	2+		
x2394.3 5	0.035 7						
x2404.4 3	0.068 9						
x2447.0† 3	0.2 1						
x2478.7 4	0.044 8						
2521.42 4	1.17 6	2521.433	2+	0.0	0+	E2	A_2=+0.204 18; A_4=−0.093 25 (1993Go23)
2547.14 5	0.393 22	2547.219	1+	0.0	0+	(M1)	A_2=−0.13 4; A_4=0.00 5 (1993Go23)
2567.8 3	0.051 8	4164.0	(1,2+)	1596.217	2+		
2576.1a 6	0.025 8	4170.8	(2+)	1596.217	2+		
x2583.9 5	0.042 8						
x2631.4 6	0.033 10						
2683.6 7	0.118 14	4279.8	(3,4+)	1596.217	2+		
x2696.7 9	0.036 10						
x2728.6 6	0.056 11						
x2737.1 9	0.026 8						
x2752.5 5	0.113 13						

Continued on next page (footnotes at end of table)

^{140}Ce(n,n′γ) 1993Go23,1985Di11 (continued)

γ(^{140}Ce) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	Comments
x2831.6 5	0.067 11						
2899.55 4	1.16 6	2899.58	2+	0.0	0+	E2	A_2=+0.213 19; A_4=−0.13 3 (1993Go23)
x3033.2 10	0.039 11						
3118.48 4	1.02 5	3118.52	2+	0.0	0+	E2	A_2=+0.278 20; A_4=−0.11 3 (1993Go23)
3120.3 2	10 1	3120.34	2+	0.0	0+	E2	A_2=+0.32 9, A_4=−0.02 13 (1985Di11).
x3141.8 17	0.027 12						
x3151.11 18	0.069 13						
x3310.0 4	0.053 8						
3319.61 6	0.48 3	3319.65	2+	0.0	0+	E2	A_2=+0.38 5; A_4=−0.06 7 (1993Go23)
x3353.8 18	0.014 10						
3408.1 4	0.077 10	3408.1	(2+)	0.0	0+		
3436.8 8	0.041 9	3436.53		0.0	0+		
3471.15 11	0.367 21	3471.19	(1,2+)	0.0	0+	(E2)	A_2=+0.20 5; A_4=−0.12 6 (1993Go23)
3491.2 7	0.044 10	3491.2?		0.0	0+		
3539.1 3	0.13 3	3539.1	2+	0.0	0+	E2	A_2=+0.29 9; A_4=+0.02 10 (1993Go23)
3567.0 10	0.037 11	3567.1	(2+)	0.0	0+		
3642.7 3	0.255 18	3642.6	1−	0.0	0+	D	A_2=−0.28 9; A_4=0.0 (1993Go23)
3646.6 6	0.076 14	3646.6	(1,2+)	0.0	0+		
3684.1 6	0.064 10	3684.1		0.0	0+		
3708.1 11	0.043 11	3708.5	(2+)	0.0	0+		
3723.4 3	0.194 14	3723.86	2+	0.0	0+	(E2)	A_2=+0.42 6; A_4=0.0 (1993Go23)
3735.2 4	0.081 12	3735.2	(1,2+)	0.0	0+		
3853.3 6	0.132 15	3853.3	(1,2+)	0.0	0+		
3879.2 8	0.080 13	3879.1	(1,2+)	0.0	0+		
4163.5 9	0.027 9	4164.0	(1,2+)	0.0	0+		
x4171.0 7	0.081 11						
4171.0 7	0.081 11	4170.8	(2+)	0.0	0+		

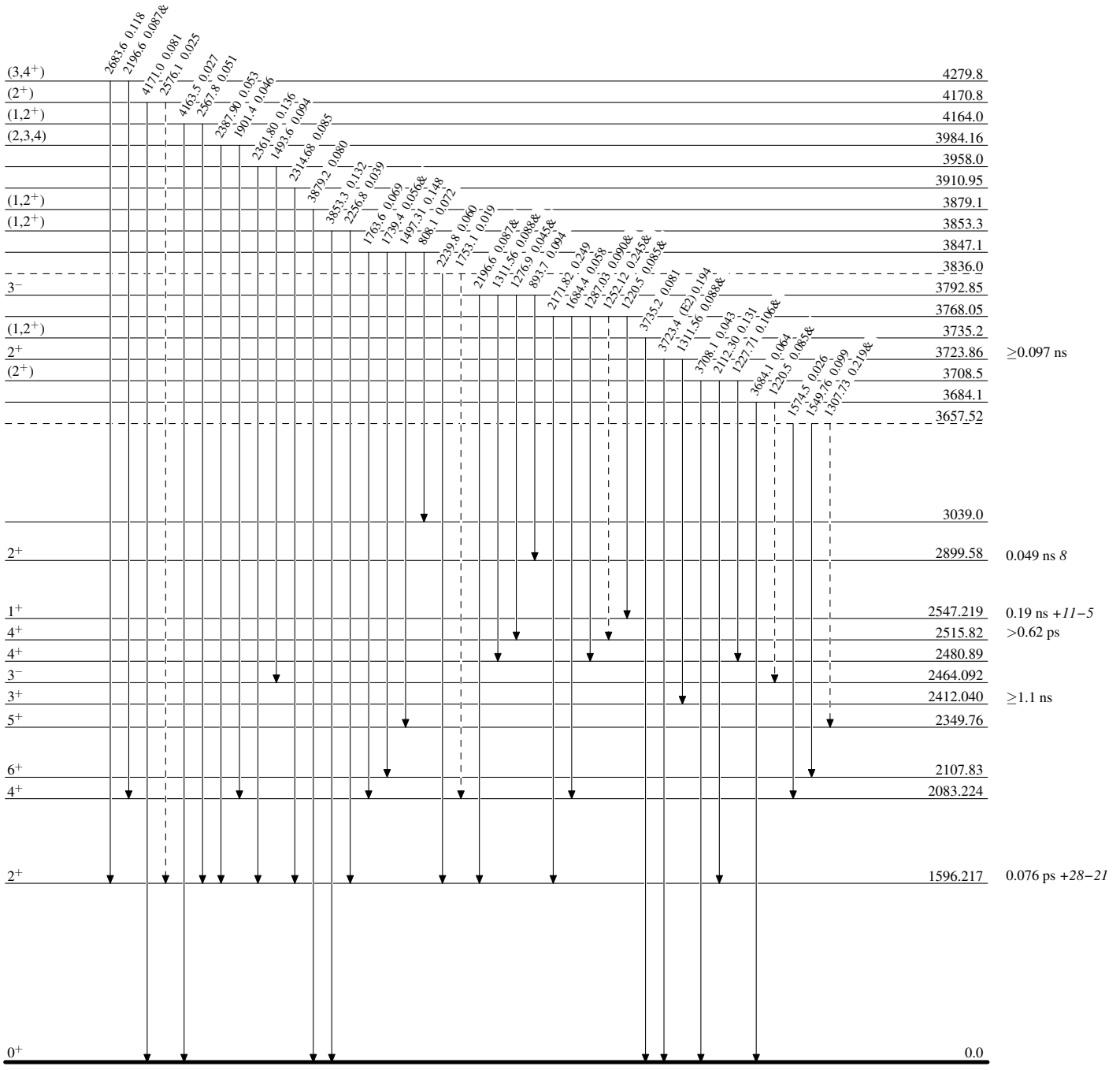
† From 1985Di11.
‡ Based on γ(θ) (1993Go23, 1985Di11) and linear polarization (1993Go23). Unless noted otherwise the values adopted are from 1993Go23. For transitions with no linear polarization measurements, D+Q transitons with significant mixing are more likely M1+E2 and Q transitions E2 respectively.
# Uncertainty not given by 1993Go23.
@ ΔJ=0 transition based on γ(θ) and when available on lin pol (1993Go23).
& Multiply placed with undivided intensity.
a Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

^{140}Ce(n,n′γ) 1993Go23,1985Di11

Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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)



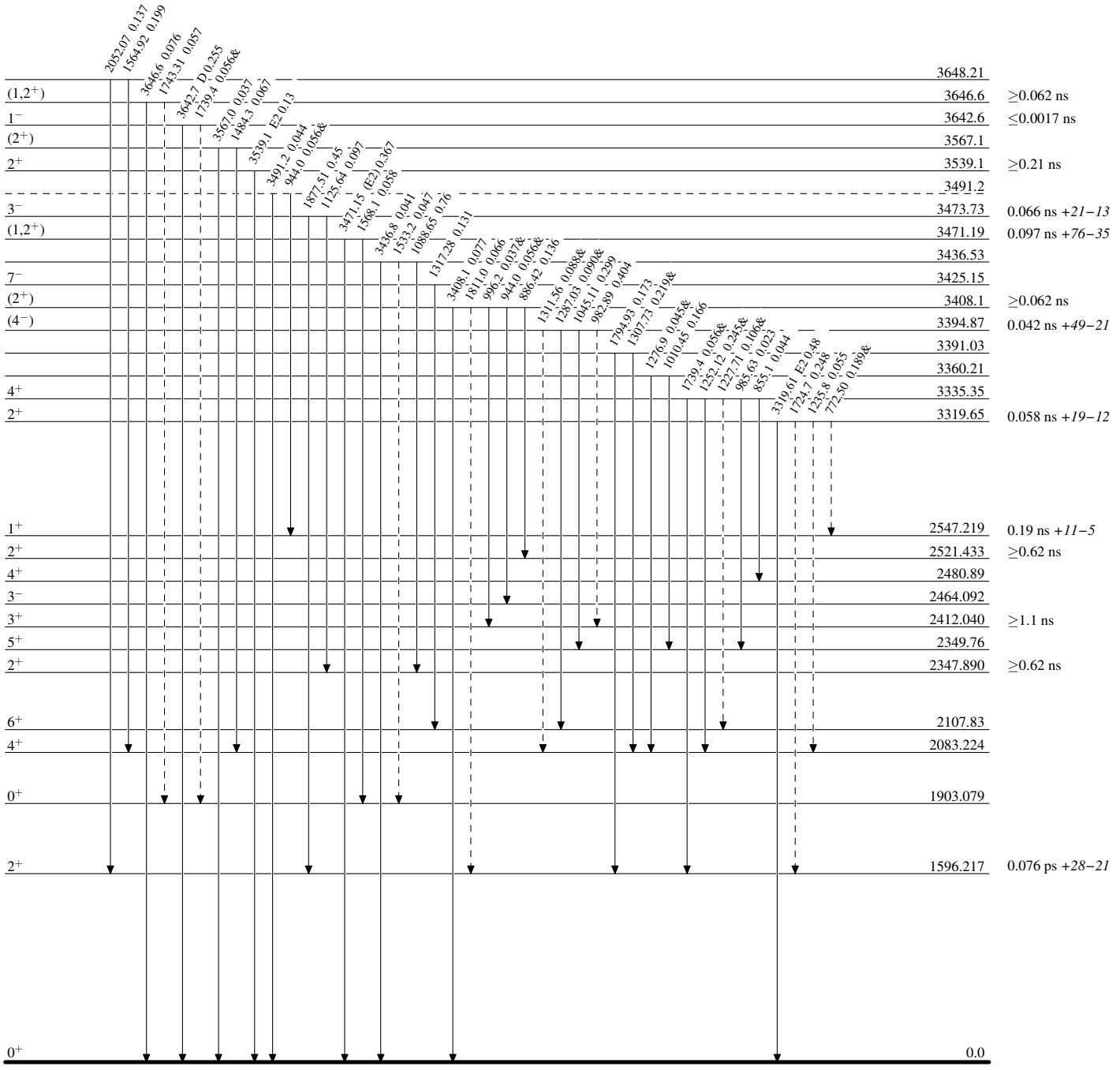
$^{140}_{58}Ce_{82}$

^{140}Ce(n,n′γ) 1993Go23,1985Di11

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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)



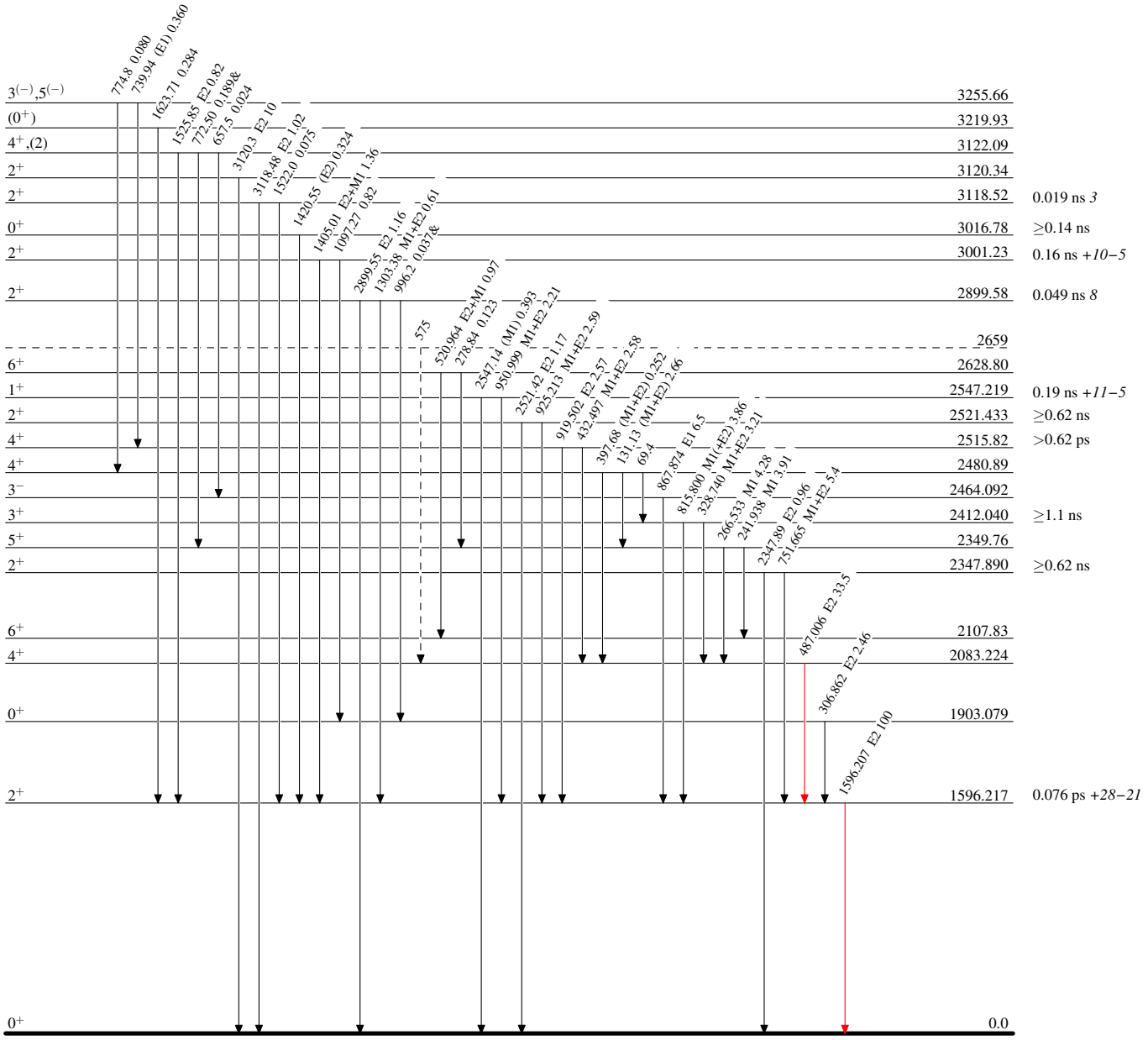
$^{140}_{58}Ce_{82}$

^{140}Ce(n,n′γ) 1993Go23,1985Di11

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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)



$^{140}_{58}Ce_{82}$