Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	G. Gürdal, E. A. Mccutchan	NDS 136, 1 (2016)	1-Jul-2016

Q(β^-)=1651.7 *15*; S(n)=7653.65 *17*; S(p)=7781.5 *15*; Q(α)=−5077.0 *14* 2012Wa38
S(2n)=17967.0 *19*; S(2p)=17921.0 *20* (2012Wa38).
Earlier studies suggested the first excited state in ^{70}Ga to be a 20-ms isomeric level at 188 keV (1966Me02,1966Re05). Subsequent studies using (p,nγ) have found no evidence for such a level, in particular a dedicated study by 1973Ca31.
α: Additional information 1.

^{70}Ga Levels

Cross Reference (XREF) Flags

A	^{68}Zn(α,d)	E	^{69}Ga(d,pγ)
B	^{68}Zn(α,pnγ)	F	^{70}Zn(p,n)
C	^{69}Ga(n,γ) E=thermal	G	^{70}Zn(p,nγ)
D	^{69}Ga(d,p)	H	^{71}Ga(d,t)

E(level)†	J$^\pi$	T$_{1/2}$‡	XREF	Comments
0.0	1$^+$	21.14 min *5*	ABCDEFGH	%β^-=99.59 *5*; %ε=0.41 *5* Q=+0.105 *7*; μ=+0.571 *2* T$_{1/2}$: weighted average of 21.15 min *5* (1977Sc10); 21.15 min *6* (1975Bu07); and 21.10 min *7* (1957Bu41). Other: 2015DuZZ. J$^\pi$: J=1 from atomic beam (1976Fu06); parity from L(d,p)=1. μ,Q: from collinear laser spectroscopy (2012Pr11). %β^-,%ε: from measurements of Zn Kα x-rays and 176γ in ^{70}Ge (1977Sc10). δ<r^2>^{71,70}=−0.096 fm^2 *21* (2012Pr11).
508.17 *8*	2$^+$		BCDEFGH	J$^\pi$: $\gamma(\theta)$ in (p,nγ) and L(d,p)=1.
651.12 *9*	1$^+$,2$^+$		CDEFGH	J$^\pi$: $\gamma(\theta)$ in (p,nγ) and L(d,p)=1+3.
690.89 *9*	2$^-$		BCDEFGH	J$^\pi$: $\gamma(\theta)$ in (p,nγ) and E1 691γ to 1$^+$.
879.01 *13*	4$^-$	22.7 ns *5*	BCDEFGH	μ=−0.26 *10* J$^\pi$: $\gamma(\theta)$ in (p,nγ) and E2 188γ to 2$^-$. T$_{1/2}$: from $\gamma\gamma$(t) in (p,nγ). Others: 22 ns *2* from $\gamma\gamma$(t) in ^{68}Zn(α,pnγ), 28 ns *3* from recoil-$\gamma\gamma$(t) in ^{198}Pt(^{76}Ge,Xγ) (1997Is13). μ: from TDPAD in ^{69}Ga(d,pγ) (1976Ta09).
901.41 *12*	1$^+$,2$^+$,3$^+$	<1.4@ ns	B D FGH	J$^\pi$: M1+E2 393γ to 2$^+$, L(d,p)=L(d,t)=3.
995.45 *10*	2$^+$		CD FGH	J$^\pi$: $\gamma(\theta)$ in (p,nγ) and L(d,p)=L(d,t)=1+3.
1002.8 *10*			G	
1009.2 *10*			d fGh	
1009.41 *21*	1$^+$,2$^+$,3$^+$		Cd fGh	J$^\pi$: $\gamma(\theta)$ in (p,nγ) and L(d,p)=1+3.
1014.90 *13*	1$^+$,2$^+$,3$^+$		CD fGH	J$^\pi$: $\gamma(\theta)$ in (p,nγ) and L(d,p)=1+3.
1023.89 *12*	2$^+$,3$^+$		CD FGH	J$^\pi$: $\gamma(\theta)$ in (p,nγ) and L(d,p)=L(d,t)=1+3.
1034.03 *14*	(5)$^-$		B D GH	J$^\pi$: D 155γ to 4$^-$, L(d,p)=L(d,t)=4, yield function in (α,pnγ) consistent with J=5.
1086.31? *16*		24@ ns *4*	B	
1101.49 *22*	2$^-$,3$^-$,4$^-$		D FGH	J$^\pi$: L(d,p)=2+4.
1135.40 *10*	1,2		d fGh	J$^\pi$: $\gamma(\theta)$ in (p,nγ).
1140.42 *9*	1,2		Cd fGh	J$^\pi$: $\gamma(\theta)$ in (p,nγ).
1180.52 *15*	5		B	J$^\pi$: $\gamma(\theta)$ in (α,pnγ).
1203.83 *20*	2$^+$	>220 fs	CDEFGH	J$^\pi$: $\gamma(\theta)$ in (p,nγ) and L(d,t)=1.
1234.38 *15*	(6)$^-$		B D GH	J$^\pi$: D(+Q) 200γ to 5$^-$, L(d,p)=L(d,t)=4; yield function in (α,pnγ) consistent with J=6.
1244.61 *10*	2	>500 fs	a D FG	J$^\pi$: $\gamma(\theta)$ in (p,nγ).

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Adopted Levels, Gammas (continued)

^{70}Ga Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
1253.45 *16*	3⁻,4⁻		a CD G	Jπ: M1 374.5γ to 4⁻, 562γ to 2⁻.
1258.72 *15*	1⁺ to 4⁺		a fGH	XREF: H(1250). Jπ: γ(θ) in (p,nγ).
1263.5 *6*			aBCD f H	E(level): in (n,γ) E=thermal two depopulating transitions of 612.3 keV and 755γ are observed while in ^{67}Zn(α,pγ) a single depopulating transition of 1263.5 keV is observed; the lack of overlap of depopulating transitions could indicate a closely spaced doublet.
1306.11 *19*			Cd Gh	Jπ: L(d,t)=1 for the doublet.
1307.0 *4*			d Gh	Jπ: L(d,t)=1 for the doublet.
1312.1 *3*	1⁺,2⁺	170 fs *+50−25*	CD FGH	Jπ: γ(θ) in (p,nγ) and L(d,t)=1.
1325 *3*	⁻		D	Jπ: L(d,p)=2.
1336.61 *21*	2⁻		D FG	Jπ: γ(θ) in (p,nγ) and L(d,p)=2.
1359.42 *18*	2⁺		CD FG	Jπ: γ(θ) in (p,nγ) and L(d,p)=1+3.
1371.50 *16*	(7⁻)		B	Jπ: Q 337γ to (5)⁻, yield function in (α,pγ) consistent with J=7; tentative parity based on assumption that Q=E2.
1413.2 *3*			C FG	
1445.93 *19*	1⁺,2⁺	0.27 ps *+56−9*	CD FGH	Jπ: γ(θ) in (p,nγ) and L(d,p)=1+3.
1456.47 *24*	1⁺,2⁺		CD FGH	Jπ: γ(θ) in (p,nγ) and L(d,p)=1+3.
1501.2 *5*	1⁺,2⁺		D FGH	Jπ: γ(θ) in (p,nγ) and L(d,t)=1.
1518.3 *3*	1⁺,2⁺		CD FGH	Jπ: γ(θ) in (p,nγ) and L(d,p)=L(d,t)=1+3.
1523.48 *18*			B	
1533.51 *13*	2⁺		CD FGH	Jπ: γ(θ) in (p,nγ) consistent with J=2 or 3, D+Q 1533γ to 1⁺ rules out J=3, L(d,p)=1.
1538.79 *16*	(6)		B	Jπ: J=(6,8) from γ(θ) in (α,pnγ); D+Q 304γ to (6)⁻.
1554.3 *5*	2⁺		CD FGH	Jπ: γ(θ) in (p,nγ) and L(d,t)=1.
1598[#] *5*			F	
1621.2 *4*	1⁻,2⁻		CD FGH	Jπ: γ(θ) in (p,nγ) and L(d,p)=2.
1633.56 *20*	1,2,3		C FG	Jπ: γ(θ) in (p,nγ).
1646 *2*	2⁻,3⁻,4⁻		D	Jπ: L(d,p)=2+4.
1661 *2*	⁻		D F	Jπ: L(d,p)=4.
1687.60 *18*	6⁻		B D	Jπ: J=6,7,8 from γ(θ) in (α,pnγ); L(d,p)=4 rules out 7,8.
1691.5 *8*			C F	
1720.6 *9*	1⁺,2⁺,3⁺		CD H	Jπ: L(d,p)=1+3.
1725.8 *6*			C FG	
1735.4 *10*			CD F	E(level): L(d,p)=2 and L(d,t)=1 for 1734 *3* suggests possible doublet at this energy.
1794.3 *6*	1⁺,2⁺,3⁺		CD FGH	Jπ: L(d,p)=1+3.
1807.5 *10*			D FGH	
1824.0 *8*			CD FGH	E(level): L(d,p)=2+4 for 1822 *2* and L(d,t)=1 for 1823 *3* require two levels with opposite parities near this energy.
1846.4 *20*			C	
1865.2 *7*			CD FGH	
1877 *3*			D	
1905.1 *9*	⁺		C GH	Jπ: L(d,t)=1.
1914 *2*	1⁻,2⁻		D F	Jπ: L(d,p)=0.
1930.8 *7*	⁺		CD GH	Jπ: L(d,t)=1.
1937.4 *20*	⁺		C F H	Jπ: L(d,t)=1.
1970.4 *10*	⁺		CD F H	Jπ: L(d,t)=1.
1984.4 *10*			CD F	
2016.4 *20*	⁻		CD F H	Jπ: L(d,p)=2.
2026.4 *20*			C F	
2074.4 *10*			C F	
2093[#] *4*			F	
2100 *3*	⁺		D	Jπ: L(d,p)=1.
2115.2 *17*			C FG	

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Adopted Levels, Gammas (continued)

^{70}Ga Levels (continued)

E(level)[†]	Jπ	XREF	Comments
2128[#] *4*		C F	
2142.6 *17*	−	CD FG	Jπ: L(d,p)=2.
2164.3 *10*		C F	
2189.7 *14*		C FG	
2213.7 *14*		C FG	
2232.2 *14*		CD FG	
2254.5 *20*		C F	
2300 *3*	+	D	Jπ: L(d,p)=1.
2319.6 *9*		C FG	
2351.2 *9*		C FG	
2374[#] *5*		F	
2388.5 *10*		C F	
2409.8 *9*		C FG	
2430.5 *10*		C F	
2446 *3*	−	D	Jπ: L(d,p)=2.
2464.4 *10*		C F	
2477.5 *10*		C F	XREF: F(2484).
2520.5 *10*	−	CD F	Jπ: L(d,p)=2.
2548.5 *20*		C F	
2571.5 *10*	−	CD F	Jπ: L(d,p)=2.
2601.41 *18*	(8)	B	Jπ: D(+Q) 1230γ to (7), $\gamma(\theta)$ and yield function in (α,pnγ) favor J=8.
2624.5 *20*		C F	
2651.51 *18*	−	B D	Jπ: L(d,p)=2.
2654.5 *10*		C F	
2682[#] *5*		F	
2698.0 *17*		C F	
2726[#] *5*		F	
2886.21 *21*	(9)	AB	XREF: A(2880). Jπ: D(+Q) 285γ to (8) and yield function in (α,pnγ) consistent with J=9.
(7653.67 *22*)	1−,2−	C	Jπ: Assuming s-wave neutron capture on $J^{\pi}=3/2^{-}$ target. E(level): 2012Wa38 give 7653.65 *17*.

[†] From a least-squares fit to Eγ, by evaluators, for level connected by gammas. Otherwise from (d,p) except where noted.
[‡] From DSAM in (p,nγ), except where noted.
[#] From (p,n).
[@] From $\gamma\gamma$(t) in (α,pnγ).

Adopted Levels, Gammas (continued)

γ(^{70}Ga)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α	Comments
508.17	2^+	508.1 *1*	100	0.0	1^+	M1		1.20×10^{-3}	α(K)exp=9.7×10^{-4} *12* (1984Fe03) α(K)=0.001073 *15*; α(L)=0.0001093 *16*; α(M)=1.599×10^{-5} *23*; α(N)=8.65×10^{-7} *13*
651.12	$1^+,2^+$	651.2 *1*	100	0.0	1^+				
690.89	2^-	690.8 *1*	100	0.0	1^+	E1		3.01×10^{-4}	α(K)exp=2.8×10^{-04} *10* (1984Fe03) α(K)=0.000269 *4*; α(L)=2.71×10^{-5} *4*; α(M)=3.96×10^{-6} *6*; α(N)=2.13×10^{-7} *3*
879.01	4^-	188.1[@] *1*	100	690.89	2^-	E2		0.0652	α(K)=0.0578 *9*; α(L)=0.00641 *9*; α(M)=0.000930 *14*; α(N)=4.49×10^{-5} *7* B(E2)(W.u.)=5.80 *13* Mult.: Q from $\gamma(\theta)$ in (p,nγ) and (α,pnγ); M2 excluded by comparison to RUL. δ: 0.00 *+(−14* from $\gamma(\theta)$ in (p,nγ).
901.41	$1^+,2^+,3^+$	393.2[a] *1*	100[a] *9*	508.17	2^+	M1+E2	<0.7	0.0026 *5*	α(K)exp=2.2×10^{-03} *4* (1984Fe03) α(K)=0.0023 *4*; α(L)=0.00024 *4*; α(M)=3.5×10^{-5} *6*; α(N)=1.9×10^{-6} *3* B(E2)(W.u.)>0.7; B(M1)(W.u.)>0.00016 δ: from α(K)exp.
		902.5[b] *10*	<15	0.0	1^+				
995.45	2^+	344.5 *2*	50 *13*	651.12	$1^+,2^+$	M1		0.00296	α(K)exp=2.6×10^{-03} *8* (1984Fe03) α(K)=0.00265 *4*; α(L)=0.000272 *4*; α(M)=3.98×10^{-5} *6*; α(N)=2.14×10^{-6} *3*
		487.2 *1*	100 *9*	508.17	2^+				
		995.9 *3*	66 *11*	0.0	1^+				
1002.8		1002.8 *10*	100	0.0	1^+				
1009.2		1009.2 *10*	100	0.0	1^+				
1009.41	$1^+,2^+,3^+$	318.5 *2*	100	690.89	2^-	E1+M2		0.00225 *14*	α(K)exp=3.8×10^{-03} *10* (1984Fe03) α(K)=0.00201 *12*; α(L)=0.000205 *13*; α(M)=2.99×10^{-5} *19*; α(N)=1.58×10^{-6} *10* Mult.: M1 or E1+M2 from α(K) exp in (p,nγ); $\Delta\pi$=no from level scheme.
		1009.8 *10*	24	0.0	1^+				
1014.90	$1^+,2^+,3^+$	363.8 *1*	45	651.12	$1^+,2^+$	M1		0.00260	α(K)exp=2.2×10^{-03} *5* (1984Fe03) α(K)=0.00233 *4*; α(L)=0.000239 *4*; α(M)=3.49×10^{-5} *5*; α(N)=1.88×10^{-6} *3*
		1014.4 *6*	100	0.0	1^+				
1023.89	$2^+,3^+$	515.7 *1*	100 *6*	508.17	2^+				
		1023.3 *5*	10 *6*	0.0	1^+				
1034.03	$(5)^-$	154.9 *1*	100	879.01	4^-	M1		0.0218	α(K)exp=1.4×10^{-02} *5* (1984Fe03) α(K)=0.0195 *3*; α(L)=0.00204 *3*; α(M)=0.000298 *5*; α(N)=1.593×10^{-5} *23*

$^{70}_{31}Ga_{39}$-4

Adopted Levels, Gammas (continued)

γ(^{70}Ga) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α	Comments
									Mult.: D from α(K)exp in (p,nγ), Δπ=no from level scheme. δ: 0.00 *1* from γ(θ) in (α,pnγ).
1086.31?		184.9[@b] *1*	100	901.41	$1^+,2^+,3^+$				
1101.49	$2^-,3^-,4^-$	410.6 *2*	100	690.89	2^-				
1135.40	1,2	444.3 *4*	12 *5*	690.89	2^-				
		1135.4 *1*	100 *5*	0.0	1^+				
1140.42	1,2	632.3 *2*	49 *5*	508.17	2^+				
		1140.4 *1*	100 *5*	0.0	1^+				
1180.52	5	146.8[@] *1*	35[@]	1034.03	$(5)^-$	D+Q[&]	+1.1[&] *3*		
		301.2[@] *1*	100[@]	879.01	4^-	D(+Q)[&]	0.0[&] *1*		
1203.83	2^+	1203.8 *2*	100	0.0	1^+	M1+E2	−0.10 *7*	1.99×10^{-4}	α(K)=0.0001723 *25*; α(L)=1.732×10^{-5} *25*; α(M)=2.53×10^{-6} *4*; α(N)=1.377×10^{-7} *20* B(E2)(W.u.)<1.4; B(M1)(W.u.)<0.06 Mult.: D+Q from γ(θ) in (p.nγ), Δπ=no from level scheme.
1234.38	$(6)^-$	200.3[@] *1*	100[@]	1034.03	$(5)^-$	M1(+E2)	0.0[&] *1*	0.0113 *5*	α(K)=0.0101 *4*; α(L)=0.00105 *5*; α(M)=0.000153 *7*; α(N)=8.2×10^{-6} *3* Mult.: D(+Q) from γ(θ) in (α,pnγ), Δπ=no from level scheme.
		355.8[@] *1*	6[@]	879.01	4^-				
1244.61	2	1244.6 *1*	100	0.0	1^+	D+Q	−0.05 *4*		
1253.45	$3^-,4^-$	374.5 *1*	100 *6*	879.01	4^-	M1		0.00243	α(K)exp=2.1×10^{-03} *5* (1984Fe03) α(K)=0.00217 *3*; α(L)=0.000223 *4*; α(M)=3.26×10^{-5} *5*; α(N)=1.757×10^{-6} *25*
		561.7 *4*	12 *6*	690.89	2^-				
1258.72	1^+ to 4^+	234.8 *1*		1023.89	$2^+,3^+$	M1		0.00756	α(K)exp=7.3×10^{-03} *17* (1984Fe03) α(K)=0.00675 *10*; α(L)=0.000699 *10*; α(M)=0.0001023 *15*; α(N)=5.49×10^{-6} *8*
		608.5[b] *5*		651.12	$1^+,2^+$				
1263.5		612.3 *6*	55	651.12	$1^+,2^+$				E_γ,I_γ: from (n,γ) E=thermal.
		755 *2*	100	508.17	2^+				E_γ,I_γ: from (n,γ) E=thermal.
		1263.5 *15*		0.0	1^+				
1306.11		426.8 *2*	72 *7*	879.01	4^-				
		798.6 *3*	100 *7*	508.17	2^+				
1307.0		1307.0 *4*	100	0.0	1^+				
1312.1	$1^+,2^+$	1312.1 *3*	100	0.0	1^+				
1336.61	2^-	645.7 *2*	100 *4*	690.89	2^-	M1+E2	+1.8 *3*	0.00094 *3*	α(K)=0.000838 *23*; α(L)=8.59×10^{-5} *24*; α(M)=1.25×10^{-5} *4*; α(N)=6.68×10^{-7} *18* Mult.: D+Q from γ(θ) in (p,nγ), Δπ=no from level scheme.
		1337.0 *10*	9 *4*	0.0	1^+	E1+M2	+0.51 *27*	2.44×10^{-4} *19*	α(K)=0.00012 *4*; α(L)=1.2×10^{-5} *4*;

$^{70}_{31}Ga_{39}$-5

Adopted Levels, Gammas (continued)

γ(^{70}Ga) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α	Comments
									α(M)=1.7×10^{-6} *6*; α(N)=9.E−8 *3* Mult.: D+Q from γ(θ) in (p,nγ), Δπ=yes from level scheme.
1359.42	2$^+$	708.6[b] *10*		651.12	1$^+$,2$^+$				
		851.1 *2*	100 *13*	508.17	2$^+$	M1+E2	−0.19 *2*	3.92×10^{-4}	α(K)=0.000351 *5*; α(L)=3.55×10^{-5} *5*; α(M)=5.19×10^{-6} *8*; α(N)=2.82×10^{-7} *4* Mult.: D+Q from γ(θ) in (p,nγ), Δπ=no from level scheme.
		1359.8 *4*	59 *8*	0.0	1$^+$	M1+E2	+0.20 *8*	1.84×10^{-4}	α(K)=0.0001361 *20*; α(L)=1.366×10^{-5} *20*; α(M)=2.00×10^{-6} *3*; α(N)=1.087×10^{-7} *16* Mult.: D+Q from γ(θ) in (p,nγ), Δπ=no from level scheme.
1371.50	(7$^-$)	137.6[@] *1*	100[@]	1234.38	(6)$^-$	D(+Q)[&]	0.0[&] *1*		
		337.1[@] *1*	15[@]	1034.03	(5)$^-$	Q[&]			δ: δ(O/Q)=0.0 *1* from γ(θ) in (α,pnγ).
1413.2		904.9 *3*	100	508.17	2$^+$				
1445.93	1$^+$,2$^+$	755.0 *2*	9 *2*	690.89	2$^-$				
		794.4 *10*	2 *2*	651.12	1$^+$,2$^+$				
		1446.1 *5*	100 *10*	0.0	1$^+$				
1456.47	1$^+$,2$^+$	432.3 *8*	25 *7*	1023.89	2$^+$,3$^+$				
		554.3 *5*		901.41	1$^+$,2$^+$,3$^+$				
		948.5 *3*	14 *6*	508.17	2$^+$				
		1456.6 *8*	100 *7*	0.0	1$^+$				
1501.2	1$^+$,2$^+$	1501.2 *5*	100	0.0	1$^+$				
1518.3	1$^+$,2$^+$	867.0 *3*	37 *5*	651.12	1$^+$,2$^+$				
		1518.7 *6*	100 *10*	0.0	1$^+$				
1523.48		289.1 *1*	100	1234.38	(6)$^-$				
1533.51	2$^+$	393.1[a] *1*	72[a] *11*	1140.42	1,2				
		882.8 *10*	40 *9*	651.12	1$^+$,2$^+$				
		1533.2 *8*	100 *9*	0.0	1$^+$	M1+E2	+0.5 *4*	2.03×10^{-4} *8*	α(K)=0.0001092 *22*; α(L)=1.095×10^{-5} *22*; α(M)=1.60×10^{-6} *4*; α(N)=8.71×10^{-8} *17* Mult.: D+Q from γ(θ) in (p,nγ), Δπ=no from level scheme.
1538.79	(6)	167.4[@] *1*	40[@]	1371.50	(7$^-$)	D(+Q)[&]	+0.1[&] *1*		
		304.3[@] *1*	100[@]	1234.38	(6)$^-$	D+Q[&]	+0.4[&] *1*		
1554.3	2$^+$	1045.3 *8*	100 *10*	508.17	2$^+$	M1+E2		2.73×10^{-4} *19*	α(K)=0.000244 *17*; α(L)=2.47×10^{-5} *18*; α(M)=3.6×10^{-6} *3*; α(N)=1.95×10^{-7} *13* Mult.: D+Q from γ(θ) in (p,nγ), Δπ=no from level scheme.
		1554.3 *8*	49 *6*	0.0	1$^+$	M1+E2	+0.25 *9*	2.03×10^{-4} *4*	α(K)=0.0001056 *15*; α(L)=1.058×10^{-5} *15*; α(M)=1.548×10^{-6} *22*; α(N)=8.42×10^{-8} *12* Mult.: D+Q from γ(θ) in (p,nγ), Δπ=no from level scheme.

$^{70}_{31}Ga_{39}$-6

Adopted Levels, Gammas (continued)

γ(^{70}Ga) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[#]	α	Comments
1621.2	1⁻,2⁻	930.4 *6*	<8	690.89	2⁻				
		969.5 *10*	92 *9*	651.12	1⁺,2⁺				
		1620.5 *8*	100 *10*	0.0	1⁺				
1633.56	1,2,3	982.6 *10*	57 *7*	651.12	1⁺,2⁺				
		1125.4 *2*	100 *10*	508.17	2⁺				
		1633.1 *10*	28 *6*	0.0	1⁺				
1687.60	6⁻	316.1[@] *1*	100	1371.50	(7⁻)	M1(+E2)[&]	+0.05[&] *10*	0.00366 *14*	α(K)=0.00327 *12*; α(L)=0.000336 *13*; α(M)=4.92×10^{-5} *19*; α(N)=2.65×10^{-6} *10*
1691.5		427 *2*	100	1263.5					E_γ,I_γ: from (n,γ) E=thermal.
		1038[b] *2*	45	651.12	1⁺,2⁺				E_γ,I_γ: from (n,γ) E=thermal.
1720.6	1⁺,2⁺,3⁺	362[b] *2*	100	1359.42	2⁺				E_γ,I_γ: from (n,γ) E=thermal.
1725.8		1725.5 *7*	100	0.0	1⁺				
1794.3	1⁺,2⁺,3⁺	1794.2 *7*	100	0.0	1⁺				
1807.5		1807.5 *10*	100	0.0	1⁺				
1824.0		1823.2 *15*	100	0.0	1⁺				
1865.2		1865.0 *7*	100	0.0	1⁺				
1905.1	+	1904.8 *10*	100	0.0	1⁺				
1930.8	+	1930.8 *7*	100	0.0	1⁺				
2115.2		2118 *2*	100	0.0	1⁺				
2142.6	−	2143 *2*	100	0.0	1⁺				
2164.3		2163 *3*	100	0.0	1⁺				E_γ,I_γ: from (n,γ) E=thermal.
2189.7		2190 *2*	100	0.0	1⁺				
2213.7		2214 *2*	100	0.0	1⁺				
2232.2		2231 *2*	100	0.0	1⁺				
2319.6		2320 *2*	100	0.0	1⁺				
2351.2		2350 *2*	100	0.0	1⁺				
2409.8		2411 *2*	100	0.0	1⁺				
2464.4		2464 *3*	100	0.0	1⁺				
2601.41	(8)	1229.9[@] *1*	100	1371.50	(7⁻)	D(+Q)[&]	0.0[&] *2*		
2651.51	−	1280.0[@] *1*	100	1371.50	(7⁻)				
2698.0		2699 *3*	100	0.0	1⁺				E_γ,I_γ: from (n,γ) E=thermal.
2886.21	(9)	284.8[@] *1*	100	2601.41	(8)	D(+Q)[&]	0.0[&] *2*		
(7653.67)	1⁻,2⁻	4956 *2*	45 *6*	2698.0					
		4999 *1*	23 *4*	2654.5					
		5029 *2*	3.7 *6*	2624.5					
		5082 *1*	26 *4*	2571.5	−				
		5105 *2*	8.0 *16*	2548.5					
		5133 *1*	26 *4*	2520.5	−				
		5176 *1*	11.8 *20*	2477.5					
		5189 *1*	17 *3*	2464.4					
		5223 *1*	11.2 *20*	2430.5					
		5244 *1*	3.7 *6*	2409.8					

$^{70}_{31}Ga_{39}$-7

Adopted Levels, Gammas (continued)

γ(^{70}Ga) (continued)

E_i(level)	E_γ †	I_γ †	E_f	J^π_f	E_i(level)	J^π_i	E_γ †	I_γ †	E_f	J^π_f
(7653.67)	5265[b] *1*	3.3 *6*	2388.5		(7653.67)	$1^-,2^-$	5933[b] *1*	6.3 *10*	1720.6	$1^+,2^+,3^+$
	5302 *1*	9.8 *16*	2351.2				5961 *1*	5.9 *10*	1691.5	
	5334 *1*	16 *3*	2319.6				6020 *1*	4.3 *6*	1633.56	1,2,3
	5399 *2*	7.3 *12*	2254.5				6031 *1*	3.7 *6*	1621.2	$1^-,2^-$
	5420 *2*	2.0 *6*	2232.2				6098 *1*	20 *3*	1554.3	2^+
	5440 *2*	6.3 *10*	2213.7				6120 *1*	20 *3*	1533.51	2^+
	5464 *2*	2.7 *6*	2189.7				6135 *1*	26 *4*	1518.3	$1^+,2^+$
	5489 *1*	61 *10*	2164.3				6196 *1*	17 *3*	1456.47	$1^+,2^+$
	5511 *2*	15.1 *22*	2142.6	$^-$			6207 *1*	13.9 *20*	1445.93	$1^+,2^+$
	5527 *3*	2.0	2128				6239 *1*	11.2 *16*	1413.2	
	5539 *2*	25 *4*	2115.2				6293 *1*	12.9 *20*	1359.42	2^+
	5579 *1*	14.3 *22*	2074.4				6341 *2*	19 *3*	1312.1	$1^+,2^+$
	5627 *2*	34 *5*	2026.4				6346.5 *10*	39 *6*	1306.11	
	5637 *2*	11.8 *20*	2016.4	$^-$			6391 *2*	100	1263.5	
	5669 *1*	11.6 *20*	1984.4				6401 *2*	11.2 *16*	1253.45	$3^-,4^-$
	5683 *1*	9.6 *16*	1970.4	$^+$			6449 *1*	7.3 *10*	1203.83	2^+
	5716 *2*	3.9 *6*	1937.4	$^+$			6513.6 *10*	82 *14*	1140.42	1,2
	5723 *2*	16 *3*	1930.8	$^+$			6629.7 *15*	12.4 *20*	1023.89	$2^+,3^+$
	5747 *2*	28 *4*	1905.1	$^+$			6639 *2*	3.3 *6*	1014.90	$1^+,2^+,3^+$
	5787 *2*	2.7 *6*	1865.2				6658.5 *10*	13.5 *20*	995.45	2^+
	5807 *2*	43 *6*	1846.4				6963.3 *10*	6.1 *20*	690.89	2^-
	5829 *1*	13.5 *20*	1824.0				7003.6 *10*	53 *8*	651.12	$1^+,2^+$
	5859 *1*	9.6 *16*	1794.3	$1^+,2^+,3^+$			7147.4 *10*	4.1 *8*	508.17	2^+
	5918 *1*	4.9 *2*	1735.4				7655 *1*	<33	0.0	1^+
	5927 *1*	17 *3*	1725.8							

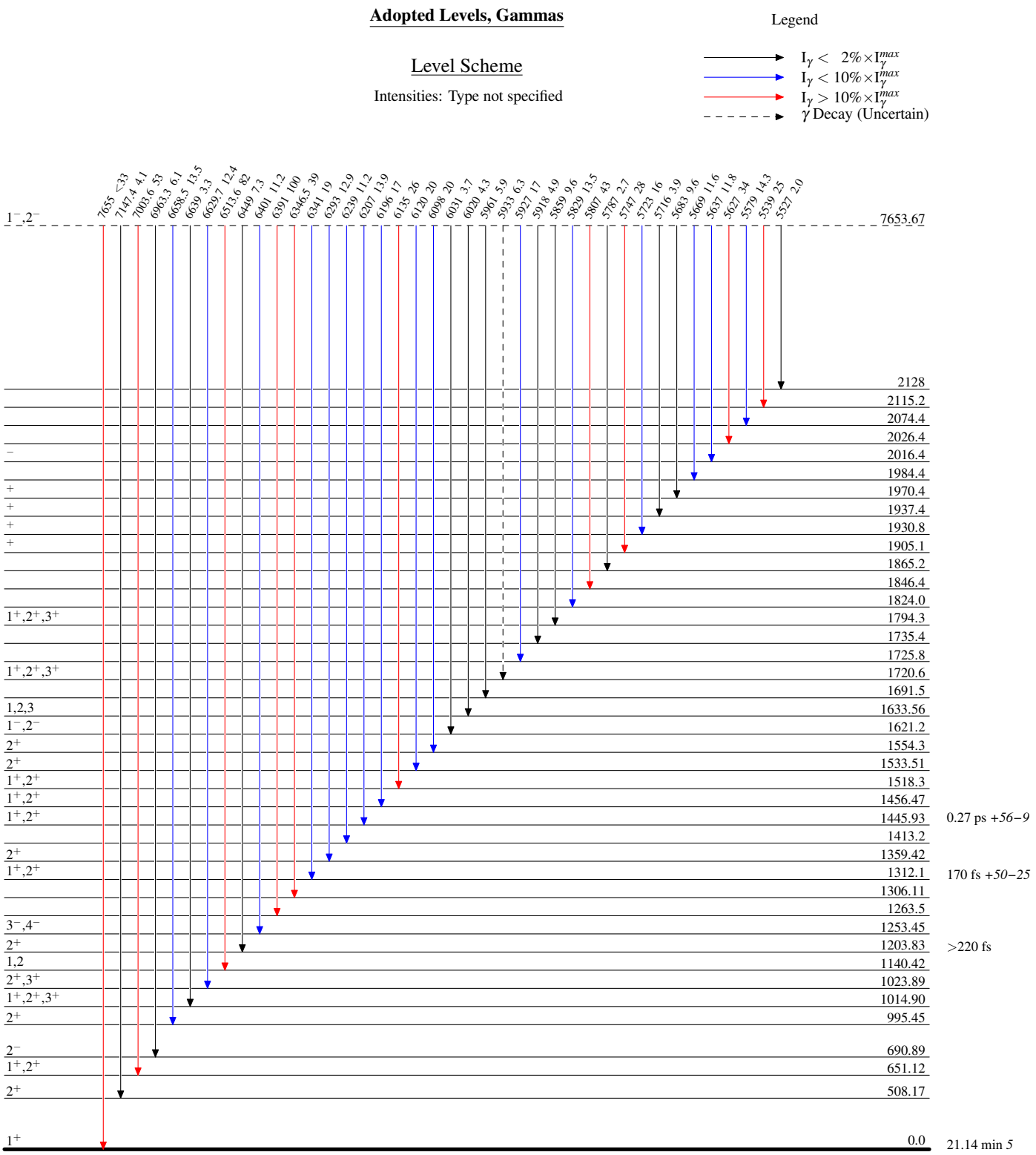
† From (p,nγ), except where noted.
‡ From α(K)exp in (p,nγ), except where noted.
# From γ(θ) in (p,nγ), except where noted.
@ From (α,pnγ).
& From γ(θ) in (α,pnγ).
[a] Multiply placed with intensity suitably divided.
[b] Placement of transition in the level scheme is uncertain.

$^{70}_{31}Ga_{39}$-8

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

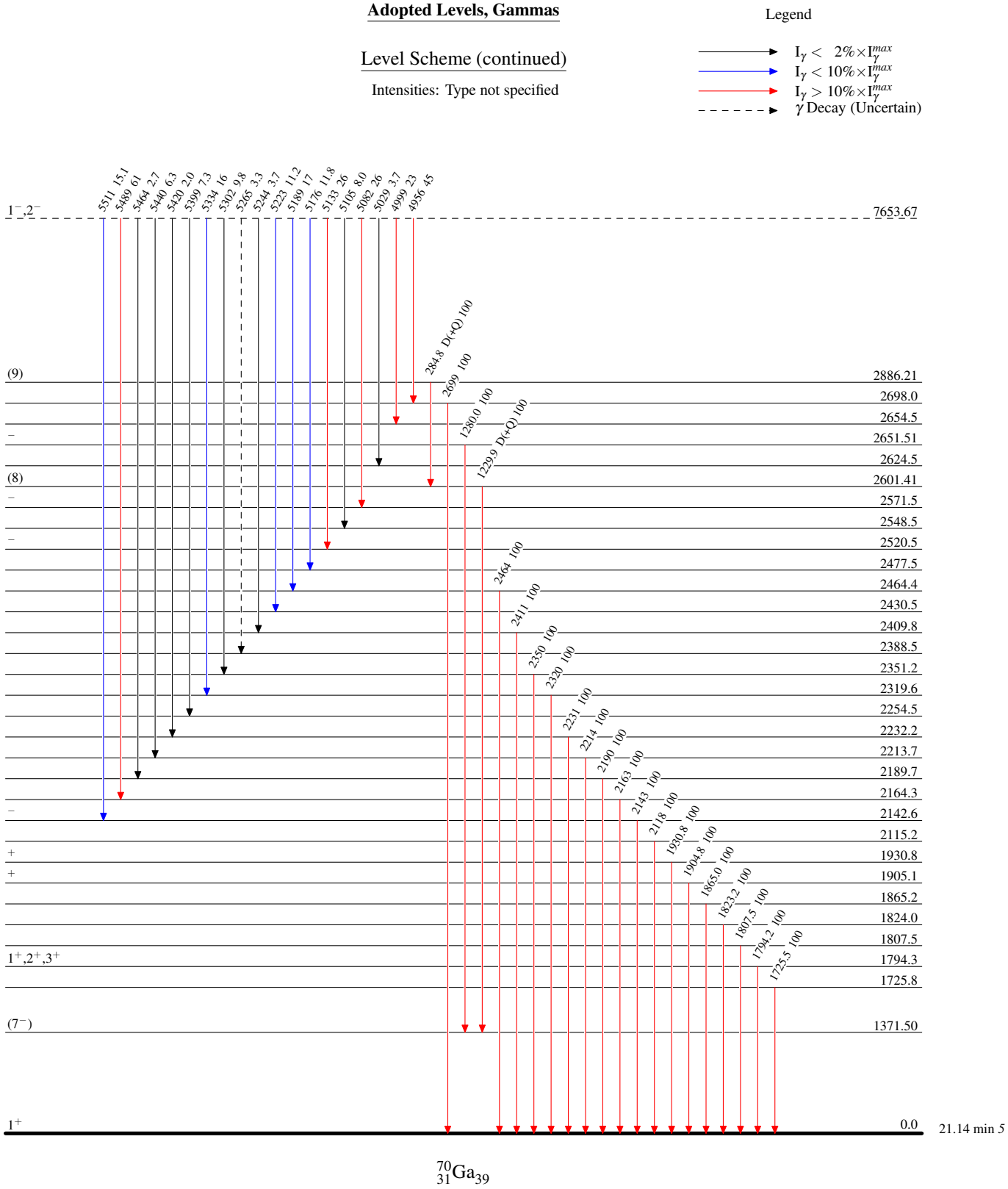


$^{70}_{31}Ga_{39}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

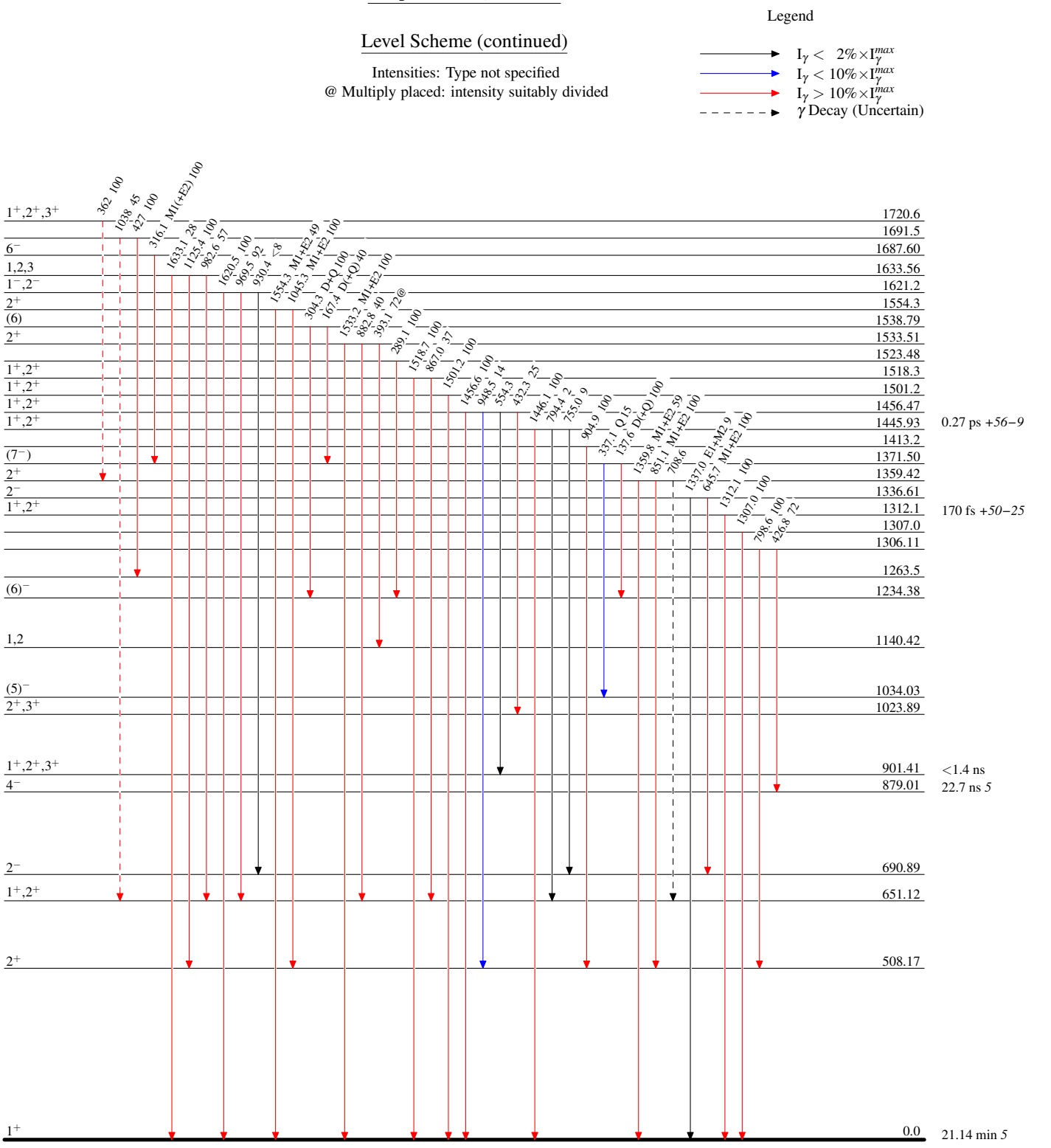


$^{70}_{31}Ga_{39}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
@ Multiply placed: intensity suitably divided

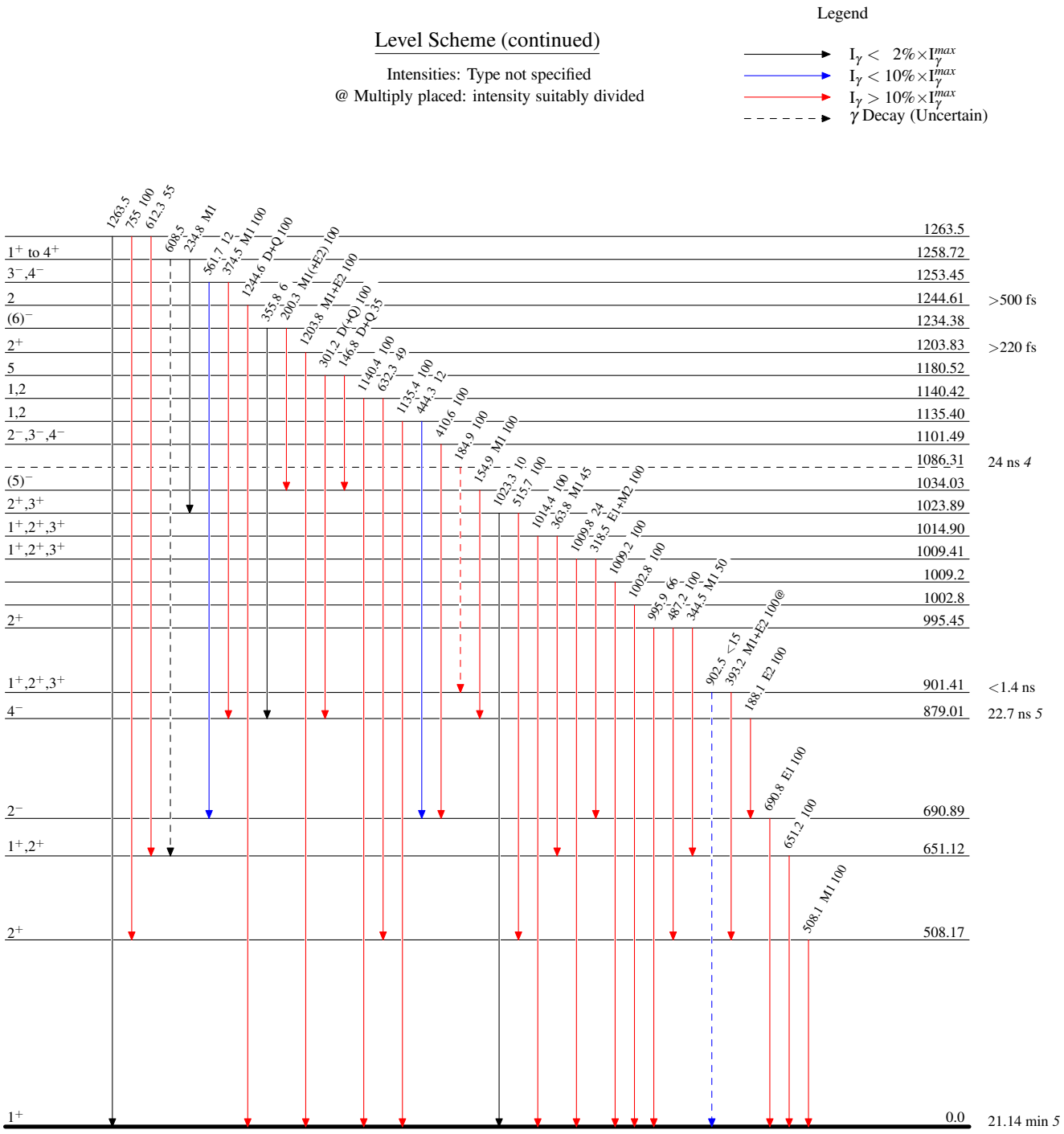


$^{70}_{31}Ga_{39}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
@ Multiply placed: intensity suitably divided



$^{70}_{31}Ga_{39}$