^{92}Zr(n,n′γ) 2005Fr17,1978Gl04

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113, 2187 (2012)	15-Sep-2012

2005Fr17: E(n)=2.6-3.9 MeV from ^{3}H(p,n)^{3}He reaction using 1 ns width pulsed and bunched P beam; neutron FWHM 60 keV; 95.16% enriched ^{92}Zr target; neutron flux monitored using Hansen-McKibben long counter; Compton-suppressed HPGe detector with BGO annulus, shielded against neutrons and background radiation with boron-loaded polyethylene, Cu and W; tof techniques used to differentiate between reaction gammas and γ-rays from background or scattering reactions In the spectrometer; measured Eγ, Iγ, lifetimes using DSAM, σ(n,n′), γ(θ) at E(n)= 2.2 MeV (8 angles) and 3.9 MeV (12 angles, 50° to 150°), excit (2.6-3.9 MeV In 100 keV steps).

1978Gl04: E(n)=2.2-3.7 MeV; Ge(Li) FWHM=2.5 keV at 1332 keV; bunched pulsed beam, ≈60 keV resolution; time-of-flight background suppression; measured Eγ, Iγ, γ(θ) (θ=30°−150°, for 24 transitions at E(n)=3.2 MeV and for 39 γ rays at 3.7 MeV), γ excitation functions. Deduced J from comparison of γ(θ) with that predicted using the Wolfenstein-Hauser-Feshbach formalism.

The level scheme is based on that from 2005Fr17. γ-ray placements are also guided by excitation function measurements from 1978Gl04.

^{92}Zr Levels

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
0.0	0^+		
934.47 *8*	2^+	5.0[@] ps *4*	
1382.77 *12*	0^+	88[@] ps *3*	
1495.51 *11*	4^+	102[@] ps *3*	
1847.23 *9*	2^+	96[c] fs *10*	$T_{1/2}$: from DSAM analysis of 913γ.
2066.60 *10*	2^+	>0.76[c] ps	
2339.56 *11*	3^-	282 fs *30*	
2398.38 *12*	4^+[&]	149 fs *16*	
2485.96 *19*	5^-		
2743.52 *18*	$(4)^-$[a]	>2.6 ps	
2819.52 *12*	2^+	64 fs *7*	No 1437γ to 0^+ 1383 level was observed by 2005Fr17.
2864.73 *18*	4^+	235 fs *+30−28*	J=4 from γ(θ) data (2005Fr17).
2904.03 *19*	0^+[b]	0.83 ps *+57−24*	
2909.29 *16*	3^+	216 fs *24*	Jπ: not J=2 from 1414γ(θ); not J=4 from 1975γ(θ) and 843γ(θ) (2005Fr17); M1+E2 transitions to 2^+ and 4^+.
3039.73 *23*	3	91 fs *10*	Jπ: π=− preferred based on small δ values for 700γ and 2105γ. J=4 excluded by 2105γ(θ); J=3 from 700γ(θ) (2005Fr17).
3057.34 *15*	2^+	98 fs *10*	
3124.54 *20*	$1^{(+)}$	58 fs *6*	
3178.25 *21*	4^+	54 fs *6*	
3191.0 *4*	(4^-)	153 fs *18*	
3262.8 *4*	2^+	12.5 fs *14*	
3275.92 *16*	3^+	53 fs *6*	J=3 from 2354γ(θ) (2005Fr17) and π=+ favored by large δ.
3288.89 *17*	(3^+)	174 fs *19*	
3371.32 *25*	$1^{(-)}$	27.0 fs *28*	
3407.75 *19*	(2^-)	0.30 ps *4*	
3452.13 *23*	(2^+)	58 fs *6*	J=2 from γ(θ) for 2518γ, 1957γ and 1605γ, but 1113γ(θ) shows slight preference for J=3 (2005Fr17).
3463.2 *4*	$(4)^+$	137 fs *+21−17*	
3472.0 *5*	1^+	5.3 fs *6*	J=1 from γ(θ) (2005Fr17).
3500.07 *20*	2^+	53 fs *5*	J=2 from 3500γ(θ) (2005Fr17).
3609.4 *4*	(0^+)	151 fs *+26−23*	Jπ: J=(0) from excit; strong 2675γ to 2^+ 934.
3628.4 *4*	(2,3)	25.6 fs *28*	
3638.2 *3*	1^-	8.4 fs *11*	
3640.3 *4*	(2^+)	128 fs *15*	Jπ: consistent with 2706γ(θ) (2005Fr17).
3649.18 *23*	(3^+)	56 fs *7*	J=(3) from γ(θ) (2005Fr17).

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^{92}Zr(n,n′γ) 2005Fr17,1978Gl04 (continued)

^{92}Zr Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
3675.8 *5*	(5^+)	116 fs *+24−20*	
3696.8 *4*	$1^{(+)}$	17.3 fs *28*	
3774.5 *3*	$1,2^{(+)}$	17 fs *5*	Jπ: fast 3697γ to 0^+ g.s. (2005Fr17).
3804.6 *5*		9 fs *+6−5*	E(level),Jπ: May be the same level As 3814-keV state In (d,p) with $J^\pi=(1,2,3,4)^{(+)}$.
3830.4 *5*	$(1^-,2^+)$		

† From least-squares fit to Eγ.
‡ Values recommended by 2005Fr17; based both on their own data and on information already available from the literature.
# From DSAM (2005Fr17). uncertainty includes statistical uncertainty and an estimated≈10% uncertainty In stopping power.
@ From Adopted Levels.
& J=3,4 from γ(θ), but J=4 favored from comparison of measured and calculated σ(n,n′) in 1978Gl04.
a γ(θ) allows J=2,3,4, but J=2,3 eliminated based on comparison of measured and calculated σ(n,n′) in 1978Gl04.
b γ(θ) allows J=0,1,2,3, but J=1,2,3 were eliminated by 1978Gl04 based on a comparison of measured and calculated σ(n,n′) in 1978Gl04.
c From γ(θ) data at E_n=2.2 MeV; sidefeeding from higher-lying states is excluded at this neutron energy.

^{92}Zr(n,n′γ) 2005Fr17,1978Gl04 (continued)

γ(^{92}Zr)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	α[b]	Comments
934.47	2+	934.5 *1*	100.0	0.0	0+	E2			σ_γ=1407 mb *152* (1978Gl04). Mult.,δ: δ=0 (2005Fr17). A_2=+0.13 *2* (E(n)=3200), A_2=+0.12 *2* (E(n)=3700) (1978Gl04).
1382.77	0+	448.3 *1*	100.0	934.47	2+	E2			σ_γ=85 mb *9* (1978Gl04). Mult.,δ: δ=0 (2005Fr17). A_2=0.0 (E(n)=3200), A_2=0.0 (E(n)=3700) (1978Gl04).
1495.51	4+	561.1 *1*	100.0	934.47	2+	E2(+M3)	+0.04 *2*		σ_γ=336 mb *36* (1978Gl04). A_2=+0.25 *3* (E(n)=3200), A_2=+0.22 *3* (E(n)=3700) (1978Gl04).
1847.23	2+	912.8[d] *1*	100.0 *23*	934.47	2+	D+Q	−0.04 *2*		σ_γ=143 mb *15* (1978Gl04). δ: −0.04 *2* or +2.6 *2* (2005Fr17); the latter is rejected based on its inconsistency with the very small δ obtained from γγ(θ) in ^{92}Nb ε decay (10.15 d). A_2=+0.10 *3* (E(n)=3200), A_2=+0.09 *2* (E(n)=3700) (1978Gl04).
		1847.2 *1*	44.6 *23*	0.0	0+	E2[&]			σ_γ=69 mb *8* (1978Gl04). Mult.,δ: δ=0 (2005Fr17). A_2=+0.17 *3* (E(n)=3200), A_2=+0.18 *2* (E(n)=3700) (1978Gl04).
2066.60	2+	219.3 *2*	0.61 *12*	1847.23	2+				
		1132.1 *1*	100 *5*	934.47	2+	D+Q	−3.2 *+5−4*		σ_γ=223 mb *24* (1978Gl04). A_2=−0.21 *1* (E(n)=3200), A_2=−0.20 *1* (E(n)=3700) (1978Gl04). δ: −3.2 *+5−4* or +0.85 *7* (2005Fr17); the former value is adopted based on its agreement with δ=−2.7 *+8−15* from ^{91}Zr(n,γ). Other δ: −2.4 *+3−4* or −1.04 *11* (1978Gl04).
		2066.7 *4*	0.53 *7*	0.0	0+	Q			Mult.,δ: δ=0 (2005Fr17).
2339.56	3−	492.4 *3*	11.7 *7*	1847.23	2+	D(+Q)	+0.01 *3*		σ_γ=10 mb *1* (1978Gl04). A_2=−0.21 *5* (E(n)=3200), A_2=−0.25 *17* (E(n)=3700), δ=+0.04 *+4−0* (1978Gl04).
		844.1 *2*	32.3[@] *18*	1495.51	4+	D+Q	+0.13 *4*		σ_γ=35 mb *4* (1978Gl04). Mult.,δ: from A_2=−0.24 *5* (E(n)=3200), A_2=−0.20 *7* (E(n)=3700) (1978Gl04).
		1405.1 *1*	100 *5*	934.47	2+	D(+Q)	+0.03 *2*		σ_γ=89 mb *10* (1978Gl04). A_2=−0.28 *2* (E(n)=3200), A_2=−0.22 *2*, A_4=+0.05 *3*, δ=−0.04 *+4−0* (E(n)=3700) (1978Gl04).
2398.38	4+	902.9 *1*	100.0 *23*	1495.51	4+	M1+E2[&]	−0.11 *+3−2*		σ_γ=69 mb *7* (1978Gl04). A_2=+0.31 *6* (E(n)=3200), A_2=+0.26 *3* (E(n)=3700) (1978Gl04). other δ: +1.30 *+13−30* or −0.13 *9* (1978Gl04).
		1463.8 *2*	35.9 *23*	934.47	2+	E2+M3[&]	−0.13 *+5−6*		σ_γ=25 mb *3* (1978Gl04). A_2=+0.29 *7* (E(n)=3200), A_2=+0.29 *7* (E(n)=3700) (1978Gl04). other δ: −0.13 *+9−5* or −5.7 *+12−173* (1978Gl04).
2485.96	5−	990.5[c] *2*	100	1495.51	4+	D(+Q)	+0.04		σ_γ=37 mb *10* (1978Gl04). Mult.,δ: from A_2=−0.19 *3* (E(n)=3200), A_2=−0.15 *2* (E(n)=3700) (1978Gl04).
2743.52	(4)−	257.6 *2*	90 *5*	2485.96	5−	D(+Q)	−0.01 *+2−3*	0.0165	σ_γ=7 mb *1* (1978Gl04).

$^{92}_{40}Zr_{52}$-3

^{92}Zr(n,n′γ) 2005Fr17,1978Gl04 (continued)

γ(^{92}Zr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
								Mult.,δ: from 2005Fr17. other data: A_2=−0.30 *11* (E(n)=3200), A_2=−0.34 *12* (E(n)=3700), δ(D,Q): +0.09 *+8−5* or ≥+11.4 or ≤−22.9 (1978Gl04).
2743.52	(4)⁻	403.9 *2*	57 *3*	2339.56	3⁻	D+Q	+0.04 *2*	σ_γ=6 mb *1* (1978Gl04).
								A_2=−0.27 *7*, δ=0.00 *4* or −8 *+3−15* (E(n)=3200); A_2=−0.15 *13*, A_4=+0.54 *19*, δ=−0.04 *+13−4* or −5.7 *+12−172* (E(n)=3700) (1978Gl04).
		1248.0 *3*	100 *5*	1495.51	4⁺	D(+Q)	+0.02 *+6−4*	σ_γ=12 mb *1* (1978Gl04).
								A_2=+0.31 *3* (E(n)=3200), A_2=+0.33 *10*, δ=−0.13 *4* (E(n)=3700) (1978Gl04).
2819.52	2⁺	972.3 *1*	100 *5*	1847.23	2⁺	D(+Q)	+0.01 *2*	σ_γ=51 mb *6* (1978Gl04).
								δ: +2.3 *+2−1* also possible but less likely (2005Fr17).
								A_2=+0.11 *3* (E(n)=3200), A_2=+0.14 *4* (E(n)=3700), δ=−0.18 *4* or +4.5 *+12−8* (1978Gl04).
		1885.0 *2*	34.2 *19*	934.47	2⁺	D+Q		σ_γ=18 mb *2* (1978Gl04).
								δ: +3.7 *+7−5* or −0.14 *4* (2005Fr17). other δ: −0.22 *+5−9* or ≥+3.7 (1978Gl04).
								A_2=0.0 (E(n)=3200), A_2=0.0 (E(n)=3700) (1978Gl04).
		2819.3 *7*	4.5 *4*	0.0	0⁺	E2		Mult.,δ: δ(Q,O)=0 (2005Fr17).
2864.73	4⁺	466.4 *3*	11.1 *10*	2398.38	4⁺	D(+Q)	−0.01 *+15−13*	
		1369.2 *2*	100 *5*	1495.51	4⁺	M1+E2[&]	−0.49 *5*	σ_γ=29 mb *3* (1978Gl04).
								A_2=+0.07 *3* (E(n)=3200), A_2=0.0 (E(n)=3700), δ=−0.47 *5* (1978Gl04).
		1930.2 *3*	26.7 *17*	934.47	2⁺	Q(+O)	−0.02 *4*	σ_γ=8 mb *1* (1978Gl04).
								A_2=+0.63 *15* (E(n)=3200), δ(Q,O)=+0.32 *+19−28* or ≥+3.7 for Eγ=1928.7 *2*(1978Gl04).
2904.03	0⁺	837.4 *2*	100[a] *5*	2066.60	2⁺			σ_γ=16 mb *2* (1978Gl04).
								A_2=0.0 (E(n)=3200), A_2=0.0 (E(n)=3700) (1978Gl04).
		1969.6 *3*	44[a] *5*	934.47	2⁺	E2		σ_γ=14 mb *1* (1978Gl04).
								Mult.,δ: δ(Q,O)=0 (2005Fr17). Other data: A_2=0.0 (E(n)=3700) (1978Gl04).
2909.29	3⁺	842.7 *4*	46 *3*	2066.60	2⁺	M1+E2[&]	−0.25 *+7−9*	Mult.: M2+E3 inconsistent with large branching.
		1413.8 *4*	78 *4*	1495.51	4⁺	M1+E2[&]		σ_γ=23 mb *3* (1978Gl04).
								δ: −0.50 *+6−7* or −1.49 *+16−14* (2005Fr17). Other data: A_2=+0.27 *8* (E(n)=3200), A_2=+0.24 *5* (E(n)=3700), δ(Q,O)=−0.5 *+3−6* if J(2909 level)=2; δ(D,Q)=−0.41 *+10−17* or −1.7 *+4−7* if J(2909 level)=3 (1978Gl04).
		1974.8 *2*	100 *5*	934.47	2⁺	M1+E2[&]	+0.13 *+0−4*	σ_γ=29 mb *3* (1978Gl04).
								Mult.: A_2=−0.10 *3* (E(n)=3200), A_2=0.0 (E(n)=3700) (1978Gl04).
								δ: from 1978Gl04 assuming J(2909 level)=3; −0.47 *5* or≈∞ if J(2909 level)=2.
3039.73	3	700.2 *3*	24.4 *18*	2339.56	3⁻	D(+Q)	+0.08 *10*	
		2105.2 *3*	100.0 *18*	934.47	2⁺	D(+Q)	+0.02 *+3−2*	σ_γ=26 mb *3* (1978Gl04).
								A_2=−0.35 *8* (E(n)=3200), A_2=−0.34 *5* (E(n)=3700), δ=−1.6 *+5−8* if J(3039 level)=2, −0.04 *+4−9* if J(3039 level)=3 (1978Gl04).
3057.34	2⁺	717.9 *2*	31.5 *19*	2339.56	3⁻	D(+Q)	−0.03 *7*	σ_γ=12 mb *1* (1978Gl04).
								A_2=−0.31 *6* (E(n)=3700) (1978Gl04). other δ: +0.41 *+17−14* or +4.5 *+31−18*.

$^{92}_{40}Zr_{52}$-4

^{92}Zr(n,n′γ) 2005Fr17,1978Gl04 (continued)

γ(^{92}Zr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
3057.34	2+	990.5[c] *2*	≈100	2066.60	2+			I_γ: from I(991γ)/I(2122γ)=2.6 *7* In 1978Gl04 and I(2123γ) In 2005Fr17. σ_γ=31 mb *8* (1978Gl04), estimated from $4\pi\sigma_\gamma(90°)$.
		1674.9 *5*	3.7 *5*	1382.77	0+	E2[&]		Mult.: δ(Q,O)=0 (2005Fr17).
		2123.0 *3*	39.1 *21*	934.47	2+	M1+E2[&]	+0.69 *16*	σ_γ=12 mb *1* (1978Gl04). A_2=+0.26 *6* (E(n)=3200), A_2=+0.41 *11* (E(n)=3700), δ=+0.4 *+12−3* for Eγ=2122.4 *7* (1978Gl04).
		3057.2 *5*	8.2 *7*	0.0	0+	E2[&]		Mult.: δ(Q,O)=0 (2005Fr17).
3124.54	1(+)	1058.0 *3*	49 *3*	2066.60	2+	D(+Q)		σ_γ=13 mb *1* (1978Gl04). δ: −3.1 *+15−59* or −0.02 *20* (2005Fr17). other data: A_2=0.0 (E(n)=3700) (1978Gl04), δ≤+0.32 if J(3124 level)=1 (−0.32 *+14−21* if J(3124 level)=2).
		1741.6 *3*	100 *5*	1382.77	0+	D		σ_γ=24 mb *3* (1978Gl04). γ placed instead As sole branch from a 4+ 3236 level by 1978Gl04. Mult.: δ(D,Q)=0 (2005Fr17). other: A_2=−0.24 *2* (E(n)=3700) (1978Gl04); δ(D,Q)=−1.09 *+9−10*, −0.13 *+4−1*, −0.04 *+4−0*, respectively, if J=4, 3, 5 and δ(Q,O)=−0.70 *+6−7* if J=2; not analyzed for adopted J=1.
		2190.3 *5*	27.3 *17*	934.47	2+			
		3124.5 *5*	31.4 *18*	0.0	0+	D		Mult.: δ(D,Q)=0 (2005Fr17).
3178.25	4+	779.9 *2*	100.0 *15*	2398.38	4+	D(+Q)	−0.04 *4*	σ_γ=23 mb *3* (1978Gl04). A_2=+0.27 *8*, A_4=−0.24 *12* (E(n)=3700) (1978Gl04).
		2243.6 *4*	25.8 *15*	934.47	2+	E2(+M3)[&]	+0.06 *+10−9*	σ_γ=7 mb *1* (1978Gl04). A_2=0.0 (E(n)=3700) (1978Gl04).
3191.0	(4−)	1695.5 *3*	100.0	1495.51	4+	D(+Q)	−0.02 *+4−3*	σ_γ=14 mb *2* (1978Gl04). A_2=+0.34 *8* (E(n)=3700), δ=−0.09 *13* or +1.3 *+3−5* (1978Gl04).
3262.8	2+	2328.4 *4*	100.0 *17*	934.47	2+	D+Q	−0.06 *3*	σ_γ=27 mb *3* (1978Gl04). A_2=0.0 (E(n)=3700) (1978Gl04). δ: from 2005Fr17. other δ: −0.27 *+9−5* (1978Gl04).
		3262.6 *5*	29.3 *17*	0.0	0+	E2[&]		Mult.: δ(Q,O)=0 (2005Fr17).
3275.92	3+	877.5 *2*	23.1 *15*	2398.38	4+	D,Q		σ_γ=5 mb *1* (1978Gl04). δ: >+10 or +0.08 *+4−5* (2005Fr17). A_2=0.0 (E(n)=3700) (1978Gl04).
		1209.4 *2*	100 *5*	2066.60	2+	D+Q	+0.13 *+0−4*	σ_γ=22 mb *2* (1978Gl04). Mult.: from A_2=−0.10 *4* (E(n)=3700) (1978Gl04). δ: if J(3275 level)=3; ∞ or −0.52 *+11−8* if J(3275 level)=2 (1978Gl04).
		1428.7 *5*	4.2 *5*	1847.23	2+			
		2341.2 *4*	27.1 *16*	934.47	2+	M1+E2[&]	+4.4 *+8−5*	
3288.89	(3+)	379.6 *2*	78 *4*	2909.29	3+	D(+Q)		σ_γ=8 mb *1* (1978Gl04). δ: +0.02 *6* or +1.5 *2* (2005Fr17). A_2=0.0 (E(n)=3700) (1978Gl04).
		1222.2 *4*	93 *5*	2066.60	2+	M1+E2[&]		σ_γ=10 mb *1* (1978Gl04).

$^{92}_{40}Zr_{52}$-5

^{92}Zr(n,n′γ) 2005Fr17,1978Gl04 (continued)

γ(^{92}Zr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
								δ: +0.68 *+9−7* or +2.31 *35* (2005Fr17). other δ: +0.04 to +1.92 if J(3289 level)=2, +0.52 *+12−16* if J(3289 level)=3 (1978Gl04). A_2=+0.41 *12* (E(n)=3700) for Eγ=1225.5 *6* (1978Gl04).
3288.89	(3$^+$)	1441.6 *5*	26.4 *18*	1847.23	2$^+$	M1+E2[&]	+0.24 *5*	
		1793.4 *3*	35.2 *22*	1495.51	4$^+$	M1+E2[&]	+0.22 *5*	
		2354.4 *3*	100 *5*	934.47	2$^+$	M1+E2[&]	+0.29 *3*	
3371.32	1$^{(-)}$	1988.6 *3*	100 *5*	1382.77	0$^+$	D		σ_γ=11 mb *1* (1978Gl04). Mult.,δ: δ(D,Q)=0 (2005Fr17). other data: A_2=0.0 (E(n)=3700) (1978Gl04).
		2436.9 *5*	43.1 *26*	934.47	2$^+$	D(+Q)		δ: +0.11 *18* or −5 *+3−27* (2005Fr17).
		3371.0 *5*	43 *3*	0.0	0$^+$	D		Mult.,δ: δ(D,Q)=0 (2005Fr17).
3407.75	(2$^-$)	1068.2 *2*	100 *4*	2339.56	3$^-$	M1+E2		σ_γ=11 mb *1* (1978Gl04). A_2=−0.50 *7* (E(n)=3700) (1978Gl04). δ: +5.8 *21* or +0.36 *+6−5* (2005Fr17). other δ: +1.2 *+7−5* if J=2, −1.7 *+7−28* if J=3, −0.13 *4* if J=4 (1978Gl04).
		2473.2 *3*	73 *4*	934.47	2$^+$	D(+Q)	+0.08 *6*	Eγ: 2474.8 *6* In 1978Gl04.
3452.13	(2$^+$)	1112.5 *8*	21.0 *21*	2339.56	3$^-$			
		1604.9 *3*	92 *5*	1847.23	2$^+$	M1+E2[&]	−1.5 *+5−8*	σ_γ=6 mb *1* (1978Gl04). A_2=−0.38 *10* (E(n)=3700), δ=−1.6 *+6−12* if J=2 for Eγ=1606.2 *8* (1978Gl04).
		1956.6 *6*	36 *3*	1495.51	4$^+$			
		2517.6 *4*	100 *6*	934.47	2$^+$	M1+E2[&]	+2.0 *12*	
3463.2	(4)$^+$	1967.7 *5*	100.0 *23*	1495.51	4$^+$			
		2528.7 *5*	33.8 *23*	934.47	2$^+$	E2(+M3)[&]	+0.11 *10*	
3472.0	1$^+$	569.7[d] *7*		2904.03	0$^+$			Eγ: from 1978Gl04; placement not adopted. A 569.5γ deexcites the 2909 level in (n,γ) and this γ is not reported by 2005Fr17 In (n,n′γ).
		2089.6[d] *5*	17.9 *14*	1382.77	0$^+$	D		Mult.,δ: δ(D,Q)=0 (2005Fr17).
		2537.5 *5*	39.2 *23*	934.47	2$^+$	D(+Q)		δ: −3 *+2−28* or 0.0 *3* (2005Fr17).
		3471.9[d] *5*	100 *5*	0.0	0$^+$	D		Mult.,δ: δ(D,Q)=0 (2005Fr17).
3500.07	2$^+$	1160.5 *5*	22.4 *18*	2339.56	3$^-$	D(+Q)	−0.04 *15*	
		1433.6 *4*	19.3 *14*	2066.60	2$^+$			
		1652.8 *3*	56 *3*	1847.23	2$^+$	M1+E2[&]		δ: +3.3 *+6−4* or −0.11 *+3−5* (2005Fr17).
		2565.6 *5*	15.8 *13*	934.47	2$^+$	M1+E2[&]		δ: −0.62 *+16−27* or −7 *+3−57* (2005Fr17).
		3499.8 *5*	100 *5*	0.0	0$^+$	E2[&]		Mult.,δ: δ(Q,O)=0 (2005Fr17).
3609.4	(0$^+$)	1762.3 *5*	29 *4*	1847.23	2$^+$			
		2674.8 *5*	100 *4*	934.47	2$^+$			
3628.4	(2,3)	2693.9 *4*	100	934.47	2$^+$			
3638.2	1$^-$	2255.4 *3*	14.1 *16*	1382.77	0$^+$	D		Mult.,δ: δ(D,Q)=0 (2005Fr17).
		3638.0 *5*	100.0 *16*	0.0	0$^+$	D		Mult.,δ: δ(D,Q)=0 (2005Fr17).
3640.3	(2$^+$)	1300.8 *8*	6.7 *26*	2339.56	3$^-$			
		2705.8 *4*	100.0 *26*	934.47	2$^+$	M1+E2[&]		δ: +3.5 *4* or −0.12 *+3−4*.
3649.18	(3$^+$)	1250.8 *3*	50 *5*	2398.38	4$^+$	M1+E2[&]		δ: +12 *+52−6* or +0.22 *+7−8*.
		1801.8 *5*	26 *4*	1847.23	2$^+$	D(+Q)		δ: −3.8 *+9−14* or −0.08 *8*.

^{92}Zr(n,n′γ) 2005Fr17,1978Gl04 (continued)

γ(^{92}Zr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
3649.18	(3$^+$)	2153.7 *5*	100 *7*	1495.51	4$^+$	M1+E2[&]		δ: −3.9 *+7−9* or −0.12 *4*.
		2714.7 *5*	73 *5*	934.47	2$^+$	M1+E2[&]	−0.73 *+12−18*	
3675.8	(5$^+$)	2180.3 *4*	100.0	1495.51	4$^+$	M1+E2[&]	+3.6 *+6−5*	
3696.8	1$^{(+)}$	2762.3 *4*	99 *7*	934.47	2$^+$	D+Q	+1.3 *+28−8*	
		3696.5 *7*	100 *7*	0.0	0$^+$	D		Mult.,δ: δ(D,Q)=0 (2005Fr17).
3774.5	1,2$^{(+)}$	1708.1 *5*	49 *10*	2066.60	2$^+$			
		1927.1 *5*	35 *7*	1847.23	2$^+$			
		2839.9 *5*	100 *20*	934.47	2$^+$			
		3774.6 *8*	46 *9*	0.0	0$^+$			δ=0 indicated by 2005Fr17 for J$^\pi$=1,2$^{(+)}$ to 0$^+$ transition.
3804.6		2870.1 *5*	100	934.47	2$^+$			
3830.4	(1$^-$,2$^+$)	1491.0 *5*	92 *18*	2339.56	3$^-$			
		2895.1 *10*	100 *18*	934.47	2$^+$			

[†] From 2005Fr17, except As noted. data from 1978Gl04 are consistent but less precise.
[‡] Branching from each level from 2005Fr17. the angle-integrated γ production cross section (σ_γ) At E(n)=3.70 MeV from 1978Gl04 is given In comments. see 1978Gl04 for σ_γ At E(n)=3.20 MeV.
[#] From γ(θ) (2005Fr17), except As noted.
[@] Uncertain in 1978Gl04 due to adjacent 847γ from ^{56}Fe.
[&] Δπ=No from RUL.
[a] From γ(θ) and verification in excitation function data.
[b] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[c] Multiply placed.
[d] Placement of transition in the level scheme is uncertain.

$^{92}_{40}Zr_{52}$-7

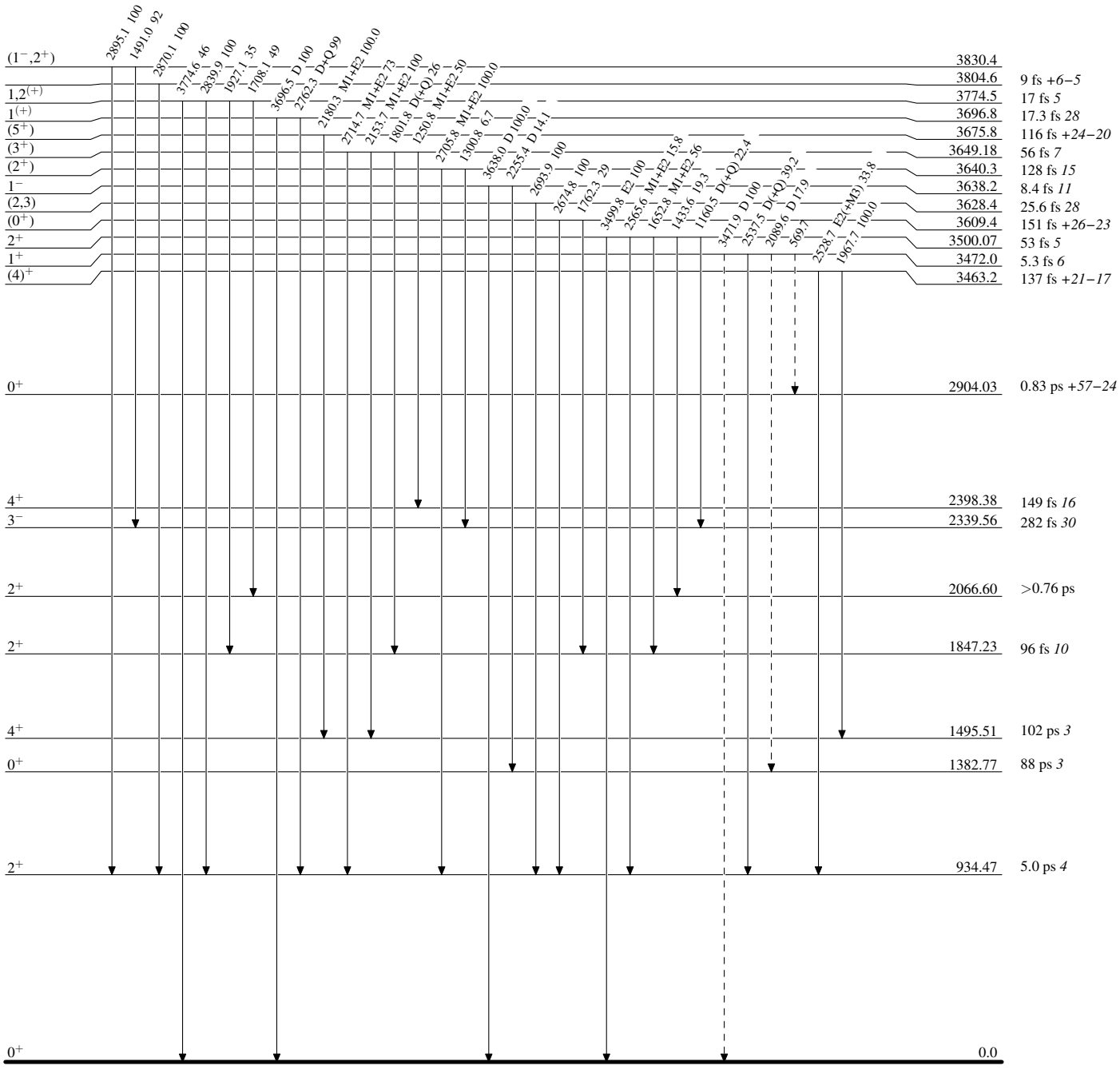
^{92}Zr(n,n′γ) 2005Fr17,1978Gl04

Legend

Level Scheme

Intensities: Relative photon branching from each level

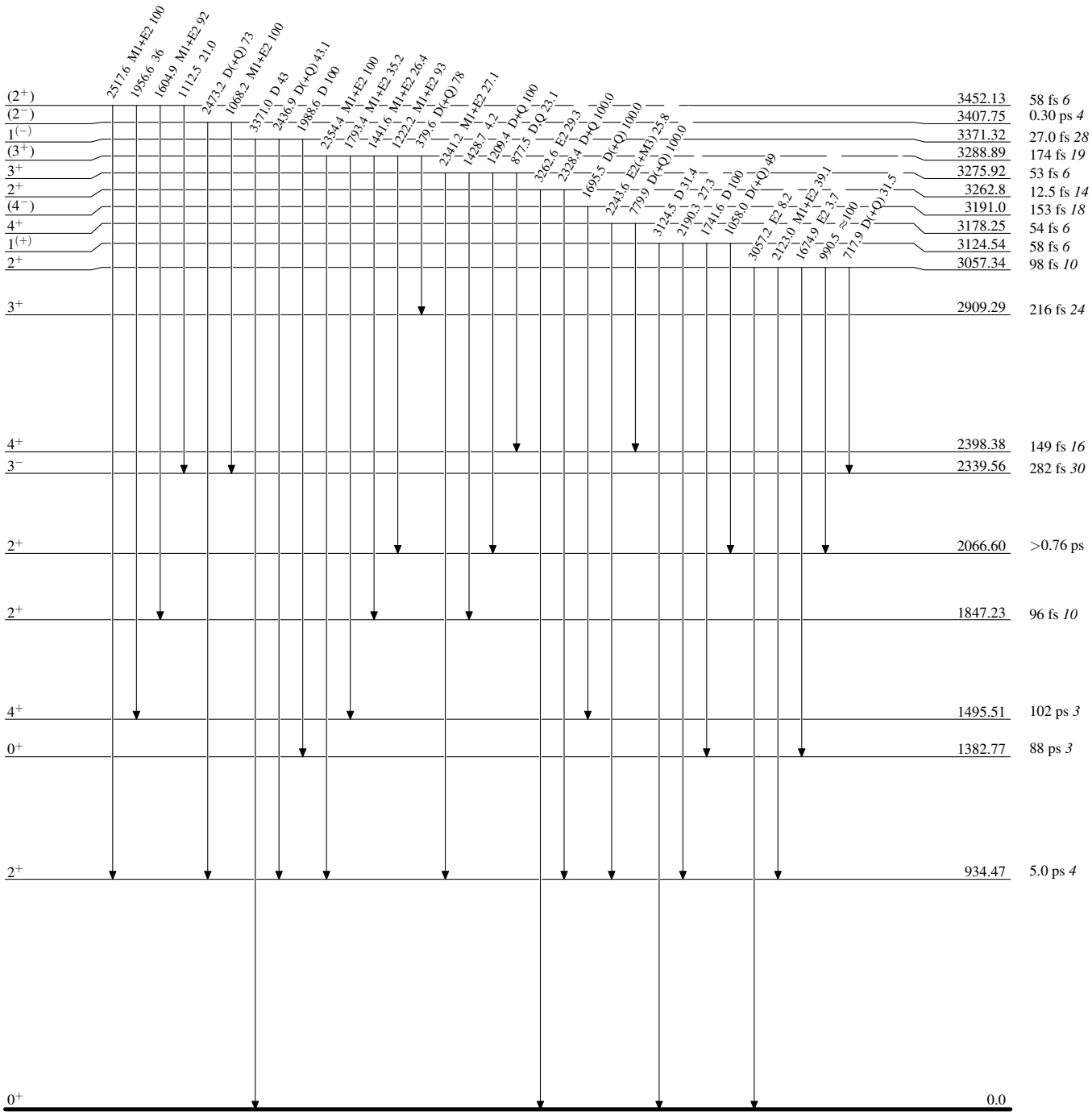
γ Decay (Uncertain)



^{92}Zr(n,n′γ) 2005Fr17,1978Gl04

Level Scheme (continued)

Intensities: Relative photon branching from each level



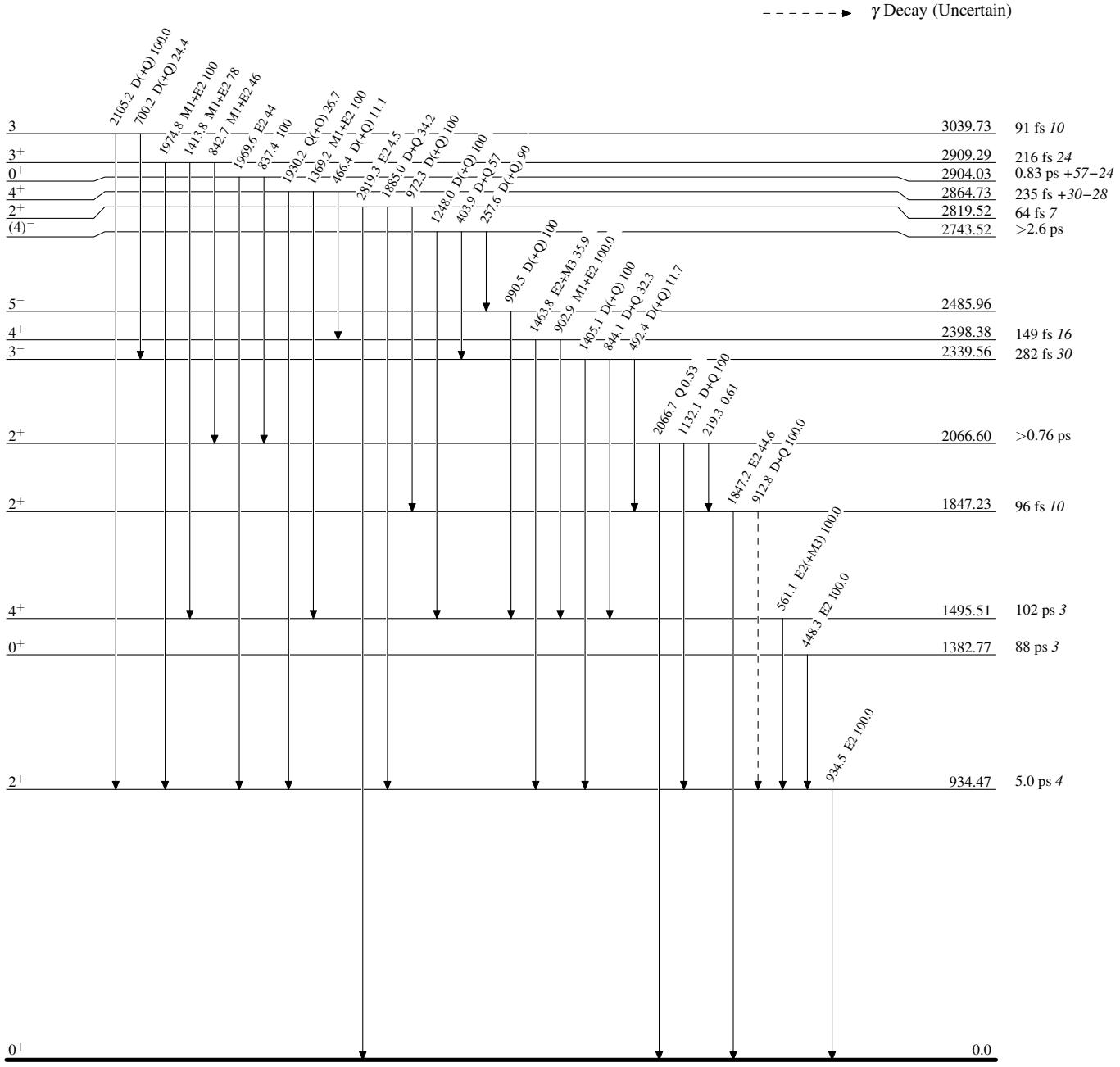
$^{92}_{40}Zr_{52}$

^{92}Zr(n,n′γ) 2005Fr17,1978Gl04

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{92}_{40}Zr_{52}$