^{76}Ga β^- decay (30.5 s) 1971Ca39

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Jun Chen and Ameenah R. Farhan	NDS 194,3 (2024)	8-Jan-2024

Parent: ^{76}Ga: E=0.0; J$^\pi$=2$^{(-)}$; $T_{1/2}$=30.5 s *4*; Q(β^-)=6916.3 *20*; %β^- decay=100

^{76}Ga-J$^\pi$,$T_{1/2}$: From ^{76}Ga Adopted Levels.

^{76}Ga-Q(β^-): From 2021Wa16.

1971Ca39: measured Eγ, Iγ. The level scheme is from RITZ-combination. No $\gamma\gamma$ coincidences were reported.

Others:

2016Do05 (also 2014Sp05): ^{76}Ga activity produced in ^{9}Be($^{76}Ge^{32+}$,X),E=130 MeV/nucleon, and separated by A1900 fragment separator at NSCL-MSU. Secondary beam consisting of 73% $^{76}Ga^{31+}$ and 27% $^{74}Zn^{30+}$ was passed through the NSCL gas stopping station where primarily the $^{76}Ga^{31+}$ beam was extracted and stopped in the gas cell. A scan of the activity as a function of mass of the extracted ions showed the molecular ion [^{76}Ga(H_2O)]$^+$ as the main activity delivered to the counting station. The ^{76}Ga ions with an energy of ≈40 keV and intensity of ≈500 particles/s were implanted into an aluminum target foil. Measured total absorption gamma-ray (TAGS) spectrum using segmented NaI(Tl)(SuN) detector, and electrons from ^{76}Ga β^- decay by a silicon surface barrier detector located inside the bore hole of the SuN detector. Also detected were $\beta\gamma$-coincidences. First results from this experiment were published by 2014Sp05, where β-Oslo method was used to deduce γ-strength function. Comparison of extracted Gamow-Teller strengths with shell-model calculations using jj4b and JUN45 interactions. Relevance to studies of neutrinoless double β-decay of ^{76}Ge.

2016To01: measured Eγ and Iγ with a focus on the intensity of the 2040.7-keV γ ray emitted in the decay of ^{76}Ga, isotope produced in ^{76}Ge(n,p),E=6.2-21 MeV reaction. These results are relevant to the measurement of ^{76}Ge $0\nu\beta\beta$ decay by GERDA Collaboration. Also discussed experimental results of ^{76}Ge(n,n$'\gamma$) reaction by the Kentucky group.

2014Do08: in connection with the importance of 2040.7γ (from 3952 level) for double beta decay experiments of ^{76}Ge, β decay of ^{76}Ga was investigated by producing the source in ^{76}Ge(p,n) reaction. Preliminary branching ratio of 2040.7γ is reported as 0.46% in comparison to 0.33% in 1971Ca39.

2014Sp05: measured total-absorption spectrum using SUN detector at NSCL-MSU in order to deduce gamma-strength functions.

1972MaWL: measured Eγ, Iγ.

$T_{1/2}$ and source production: 1985Ta01, 1981Ru07, 1974Gr29, 1970OsZZ, 1966Se04, 1961Ta08.

$\beta\gamma$-coin: 1977Al17.

β^- strength functions: 1975Al11. β^- systematics (1983Be56).

^{76}Ge Levels

E(level)‡	J$^\pi$†
0.0	0$^+$
562.93 *3*	2$^+$
1108.45 *4*	2$^+$
1410.08 *5*	4$^+$
1539.46 *6*	3$^+$
1911.09 *12*	0$^+$
2019.87 *10*	4$^+$
2284.22 *24*	(3)$^-$
2591.10 *16*	(1$^+$,2$^+$)
2654.51 *21*	
2692.40 *8*	3$^-$
2747.76 *8*	(2)$^+$
2768.76 *14*	2$^+$
2841.57 *13*	2$^+$
2919.79 *7*	1$^+$
3141.51 *7*	1$^+$
3182.21 *6*	(2$^+$)
3231.8? *4*	4$^+$
3312.33 *12*	3$^-$
3322.85 *7*	(2$^+$)

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^{76}Ga β^- decay (30.5 s) 1971Ca39 (continued)

^{76}Ge Levels (continued)

E(level)‡	Jπ†	Comments
3334.7? *3*		
3409.19 *19*	(1,2,3)	
3477.65? *17*	(2+,3)	
3632.75 *10*	(2+)	
3887.05 *19*	(3−)	
3951.89 *7*	1−	
4122.3? *4*	(1,2+)	
4192.9? *2*	(2+,3)	
4239.4? *2*	(1,2,3)	
4326.5? *2*	(1,2,3)	
4363.5? *2*	4+	
4476.5? *2*		
4600		E(level): this level corresponds to 4611 *10* level in Adopted Levels, which 2016Do05 included in their analysis.
4719.9 *2*	(2+,3,4+)	
4784.1? *3*	(1,2,3)	
4812.5? *2*	(2+,3)	
4814.8? *3*	(1,2,3)	
4950		E(level): this level corresponds to 4936.07 *20* level in Adopted Levels, which 2016Do05 included in their analysis.
5122.48 *14*	(1,2,3)	
5350		E(level): new level introduced by 2016Do05 in the analysis of their TAGS data.
5522.6 *2*	(1,2,3)	
5663.37 *15*	(2+)	
5749.9? *4*	(1,2,3)	
5883.0? *3*	(1,2,3)	
6021.1? *3*	(1,2,3)	
6065.2? *4*	(1,2,3)	

† From the Adopted Levels.
‡ From least-squares fit to Eγ data.

β^- radiations

2016Do05 compared their experimental TAGS spectrum with that simulated from β feedings given in the ^{76}Ga β^- decay level scheme from γ-ray data in 1971Ca39.

All log *ft* values are considered as tentative since the level scheme is not considered as well established. These log *ft* values cannot be used for definitive J^π assignments for ^{76}Ge levels.

E(decay)	E(level)	Iβ−†‡	Log *ft*	Comments
(851.1# *23*)	6065.2?	0.39 *7*	4.8	av Eβ=297.98 *85* Iβ−: 0.1 *1* (from TAGS, 2016Do05).
(895.2# *23*)	6021.1?	0.44 *7*	4.8	av Eβ=316.24 *85* Iβ−: 0.065 *65* (from TAGS, 2016Do05).
(1033.3# *23*)	5883.0?	0.36 *5*	5.1	av Eβ=374.42 *87* Iβ−: 0.2 *2* (from TAGS, 2016Do05).
(1166.4# *23*)	5749.9?	0.30 *5*	5.4	av Eβ=431.71 *89* Iβ−: 0.19 *8* (from TAGS, 2016Do05).
(1252.9 *23*)	5663.37	0.87 *9*	5.1	av Eβ=469.49 *88* Iβ−: 0.7 *3* (from TAGS, 2016Do05).
(1393.7 *23*)	5522.6	0.72 *9*	5.3	av Eβ=531.74 *90*

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^{76}Ga β^- decay (30.5 s) 1971Ca39 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
				Iβ^-: 0.7 *2* (from TAGS, 2016Do05).
(1566.3 *25*)	5350	1.6 *3*	5.2	av Eβ=609.18 *91* Iβ^-: from TAGS (2016Do05).
(1793.8 *23*)	5122.48	1.0 *1*	5.6	av Eβ=712.77 *92* Iβ^-: 0.7 *1* (from TAGS, 2016Do05).
(1966.3 *25*)	4950	1.1 *3*	5.7	av Eβ=792.23 *93* Iβ^-: from TAGS (2016Do05).
(2101.5[#] *23*)	4814.8?	0.88 *10*	6.0	av Eβ=854.98 *95* Iβ^-: 0.6 *1* (from TAGS, 2016Do05).
(2103.8[#] *23*)	4812.5?	0.47 *4*	6.2	av Eβ=856.05 *94* Iβ^-: <0.0001 (from TAGS, 2016Do05).
(2132.2[#] *23*)	4784.1?	0.69 *9*	6.1	av Eβ=869.27 *95* Iβ^-: 0.54 *9* (from TAGS, 2016Do05).
(2196.4 *23*)	4719.9	0.90 *9*	6.0	av Eβ=899.23 *94* Iβ^-: 0.31 *7* (from TAGS, 2016Do05).
(2316.3 *25*)	4600	3.4 *6*	5.5	av Eβ=955.36 *94* Iβ^-: from TAGS (2016Do05).
(2439.8[#] *23*)	4476.5?	1.12 *12*	6.1	av Eβ=1013.40 *95* Iβ^-: 2.3 *3* (from TAGS, 2016Do05).
(2552.8[#] *23*)	4363.5?	1.40 *14*	6.1	av Eβ=1066.69 *95* Iβ^-: 0.2 *2* (from TAGS, 2016Do05).
(2589.8[#] *23*)	4326.5?	1.33 *10*	6.2	av Eβ=1084.17 *95* Iβ^-: 2.4 *4* (from TAGS, 2016Do05).
(2676.9[#] *23*)	4239.4?	0.88 *10*	6.4	av Eβ=1125.39 *96* Iβ^-: 0.045 *45* (from TAGS, 2016Do05).
(2723.4[#] *23*)	4192.9?	1.96 *15*	6.1	av Eβ=1147.43 *96* Iβ^-: 1.2 *2* (from TAGS, 2016Do05).
(2794.0[#] *23*)	4122.3?	0.74 *7*	6.6	av Eβ=1180.93 *97* Iβ^-: 1.4 *2* (from TAGS, 2016Do05).
(2964.4 *23*)	3951.89	8.2 *6*	5.6	av Eβ=1262.00 *96* Iβ^-: 12 *1* (from TAGS, 2016Do05).
(3029.3 *23*)	3887.05	1.39 *14*	6.4	av Eβ=1292.91 *96* Iβ^-: 3 *1* (from TAGS, 2016Do05).
(3283.6 *23*)	3632.75	0.39 *17*	7.1	av Eβ=1414.44 *96* Iβ^-: 2.8 *4* (from TAGS, 2016Do05).
(3438.7[#] *23*)	3477.65?	4.4 *12*	6.2	av Eβ=1488.78 *97* Iβ^-: 1.6 *2* (from TAGS, 2016Do05).
(3507.1[#] *23*)	3409.19	0.41 *8*	7.2	av Eβ=1521.63 *97* Iβ^-: 0.24 *4* (from TAGS, 2016Do05).
(3581.6[#] *23*)	3334.7?	0.35 *5*	7.3	av Eβ=1557.41 *98* Iβ^-: 0.2 *2* (from TAGS, 2016Do05).
(3593.5 *23*)	3322.85	3.2 *2*	6.4	av Eβ=1563.10 *97* Iβ^-: 2.9 *3* (from TAGS, 2016Do05).
(3604.0[#] *23*)	3312.33	<0.15	>7.7	av Eβ=1568.16 *97* Iβ^-: 1.8 *2* (from TAGS, 2016Do05).
(3684.5[#] *23*)	3231.8?	0.14 *3*	9.4[1u]	av Eβ=1611.37 *98* Iβ^-: 0.7 *2* (from TAGS, 2016Do05).
(3734.1 *23*)	3182.21	5.5 *4*	6.2	av Eβ=1630.73 *97* E(decay): 3580 *150* from (2074γ)β-coin (1977Al17). Iβ^-: 7.4 *9* (from TAGS, 2016Do05).
(3774.8[#] *23*)	3141.51	<2.1	>6.7	av Eβ=1650.32 *97* Iβ^-: 9 *1* (from TAGS, 2016Do05).
(3996.5 *23*)	2919.79	9.1 *6*	6.1	av Eβ=1757.15 *97*

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^{76}Ga β^- decay (30.5 s) 1971Ca39 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^{-} †‡	Log *ft*	Comments
				Iβ^-: 9.8 *9* (from TAGS, 2016Do05).
(4074.7 *23*)	2841.57	0.43 *9*	7.5	av Eβ=1794.88 *97* Iβ^-: 3.9 *4* (from TAGS, 2016Do05).
(4147.5 *23*)	2768.76	0.67 *9*	7.3	av Eβ=1830.02 *97* Iβ^-: <0.0001 (from TAGS, 2016Do05).
(4168.5 *23*)	2747.76	6.1 *4*	6.4	av Eβ=1840.16 *97* Iβ^-: 5.4 *9* (from TAGS, 2016Do05).
(4223.9 *23*)	2692.40	0.40 *16*	7.6	av Eβ=1866.91 *97* Iβ^-: 0.6 *4* (from TAGS, 2016Do05).
(4261.8# *23*)	2654.51	<0.2	>7.9	av Eβ=1885.21 *98* Iβ^-: <0 (from TAGS, 2016Do05).
(4325.2 *23*)	2591.10	1.09 *12*	7.2	av Eβ=1915.85 *97* Iβ^-: 1.1 *3* (from TAGS, 2016Do05).
(4896.4 *23*)	2019.87	0.49 *9*	7.8	av Eβ=2192.28 *97* Iβ^-: 0.11 *5* (from TAGS, 2016Do05).
(5005.2# *23*)	1911.09	<0.18	>10.1^{1u}	av Eβ=2245.49 *97* Iβ^-: 0.21 *4* (from TAGS, 2016Do05).
(5376.8 *23*)	1539.46	3.8 *4*	7.1	av Eβ=2425.21 *98* Iβ^-: 0.5 *1* (from TAGS, 2016Do05).
(5506.2 *23*)	1410.08	0.34 *22*	10.1^{1u}	av Eβ=2487.70 *97* Iβ^-: 0.34 *4* (from TAGS, 2016Do05).
(5807.9 *23*)	1108.45	14.5 *16*	6.7	av Eβ=2634.40 *98* Iβ^-: 11.7 *9* (from TAGS, 2016Do05).
(6353.4 *23*)	562.93	12.7 *15*	6.9	av Eβ=2899.36 *98* Iβ^-: 7.3 *2* (from TAGS, 2016Do05).
(6916.3# *25*)	0.0	<10	>9.2^{1u}	av Eβ=3172.06 *98* Iβ^-: from TAGS data, 2016Do05 provide no information about experimental or theoretical β feeding to the ground state, which is possible from an expected first-forbidden unique transition. Evaluators deduce Iβ<10% for centroid value of log $f^{1u}t$=9.75 (2023Tu02) for such transitions. Note that for minimum log $f^{1u}t$=8.5, Iβ=40%. Such large feeding to g.s. is probably unlikely.

† Values from TAGS data in 2016Do05 are given in comments, authors list intensity values below 0.0001% as zero in their Table I.

‡ Absolute intensity per 100 decays.

Existence of this branch is questionable.

γ(^{76}Ge)

Iγ normalization: Summed γ-transition intensity=89 *5*, allowing for <10% feeding to the g.s., and 6.1% *7* feeding to 4600, 4950 and 5350 levels proposed by 2016Do05 from their TAGS data.

E_γ	I_γ[b]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[†]	δ[†]	α[c]	Comments
335.9[e] *5*	8.0 *20*	3477.65?	(2$^+$,3)	3141.51	1$^+$				%Iγ=4.7 *12*
431.0 *5*	4.6[#] *5*	1539.46	3$^+$	1108.45	2$^+$	M1+E2	+1.86 *+17−11*	0.0029 *9*	%Iγ=2.69 *33*
545.51 *3*	39.4 *20*	1108.45	2$^+$	562.93	2$^+$	E2+M1	+2.4 *2*	0.00175	%Iγ=23.1 *18*
562.93 *3*	100	562.93	2$^+$	0.0	0$^+$	E2		0.00164	%Iγ=58.5 *33*
661.4[e] *2*	1.12 *10*	3409.19	(1,2,3)	2747.76	(2)$^+$				%Iγ=0.66 *7*
843.8[e] *2*	1.73 *17*	4476.5?		3632.75	(2$^+$)				%Iγ=1.01 *12*
847.15 *5*	5.3 *3*	1410.08	4$^+$	562.93	2$^+$	E2		0.00053	%Iγ=3.10 *25*
885.83[e] *10*	2.00 *15*	4363.5?	4$^+$	3477.65?	(2$^+$,3)				%Iγ=1.17 *11*
911.40[@] *10*	1.52 *10*	2019.87	4$^+$	1108.45	2$^+$	[E2]		0.00044	%Iγ=0.89 *8*
927.05[e] *10*	1.40 *8*	4239.4?	(1,2,3)	3312.33	3$^-$				%Iγ=0.82 *7*
976.50 *5*	7.0 *2*	1539.46	3$^+$	562.93	2$^+$	M1+E2	+2.61 *20*	0.00037	%Iγ=4.10 *26*
1014.2[e] *2*	0.54 *8*	4326.5?	(1,2,3)	3312.33	3$^-$				%Iγ=0.32 *5*
[x]1043.6 *4*	0.45 *4*								%Iγ=0.263 *28*
1051.7 *2*	0.71 *10*	2591.10	(1$^+$,2$^+$)	1539.46	3$^+$				%Iγ=0.42 *6*
1108.41 *8*	24.0 *5*	1108.45	2$^+$	0.0	0$^+$	E2		0.00028	%Iγ=14.0 *8*
1175.7 *5*	0.71 *18*	2284.22	(3)$^-$	1108.45	2$^+$				%Iγ=0.42 *11*
1182.1[e] *3*	0.77 *11*	4814.8?	(1,2,3)	3632.75	(2$^+$)				%Iγ=0.45 *7*
1208.02 *13*	2.32 *17*	2747.76	(2)$^+$	1539.46	3$^+$				%Iγ=1.36 *13*
[x]1249.1 *2*	0.97 *10*								%Iγ=0.57 *7*
1259.9 *5*	0.45 *11*	3951.89	1$^-$	2692.40	3$^-$	[E2]		0.00023	%Iγ=0.26 *7*
1273.05[e] *10*	1.82 *11*	4192.9?	(2$^+$,3)	2919.79	1$^+$				%Iγ=1.07 *9*
1282.9[d] *4*	<0.43[d]	2692.40	3$^-$	1410.08	4$^+$				%Iγ<0.25
1282.9[de] *4*	<0.43[d]	5522.6	(1,2,3)	4239.4?	(1,2,3)				%Iγ<0.25
1310.6[e] *3*	0.42 *7*	4719.9	(2$^+$,3,4$^+$)	3409.19	(1,2,3)				%Iγ=0.25 *4*
1348.13 *13*	1.13 *8*	1911.09	0$^+$	562.93	2$^+$	[E2]		0.00022	%Iγ=0.66 *6*
1358.9 *6*	0.28 *9*	2768.76	2$^+$	1410.08	4$^+$				%Iγ=0.16 *6*
1443.9[e] *5*	0.39 *10*	4363.5?	4$^+$	2919.79	1$^+$	[M3]		0.00043 *12*	%Iγ=0.23 *6*
1461.2[e] *3*	0.50 *10*	4784.1?	(1,2,3)	3322.85	(2$^+$)				%Iγ=0.29 *6*
1482.5 *3*	0.75 *11*	2591.10	(1$^+$,2$^+$)	1108.45	2$^+$				%Iγ=0.44 *7*
1489.6 *4*	0.35 *10*	5122.48	(1,2,3)	3632.75	(2$^+$)				%Iγ=0.21 *6*
1502.3[e] *5*	0.74 *10*	4814.8?	(1,2,3)	3312.33	3$^-$				%Iγ=0.43 *6*
1546.0 *4*	0.65 *13*	2654.51		1108.45	2$^+$				%Iγ=0.38 *8*
1583.9 *5*	0.30 *10*	2692.40	3$^-$	1108.45	2$^+$				%Iγ=0.18 *6*
1612.7 *3*	0.68 *9*	3632.75	(2$^+$)	2019.87	4$^+$				%Iγ=0.40 *6*
1634.0[e] *2*	1.73 *8*	4326.5?	(1,2,3)	2692.40	3$^-$				%Iγ=1.01 *8*

From ENSDF

γ(^{76}Ge) (continued)

E_γ	I_γ[b]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[†]	α[c]	Comments
1639.30 *10*	8.40 *20*	2747.76	(2)$^+$	1108.45	2$^+$			%Iγ=4.91 *30*
1642.80 *15*	1.41 *10*	3182.21	(2$^+$)	1539.46	3$^+$			%Iγ=0.83 *8*
1660.30 *14*	1.17 *8*	2768.76	2$^+$	1108.45	2$^+$			%Iγ=0.68 *6*
1721.9 *7*	0.22 *7*	3632.75	(2$^+$)	1911.09	0$^+$			%Iγ=0.13 *4*
1732.70 *25*	1.10 *10*	2841.57	2$^+$	1108.45	2$^+$			%Iγ=0.64 *7*
1811.10 *12*	1.27 *7*	2919.79	1$^+$	1108.45	2$^+$			%Iγ=0.74 *6*
1878.3 *2*	0.55 *6*	4719.9	(2$^+$,3,4$^+$)	2841.57	2$^+$			%Iγ=0.32 *4*
1892.7[e] *2*	0.61 *4*	4812.5?	(2$^+$,3)	2919.79	1$^+$			%Iγ=0.357 *31*
1902.2 *2*	0.64 *5*	3312.33	3$^-$	1410.08	4$^+$			%Iγ=0.37 *4*
1912.7 *1*	0.89 *5*	3322.85	(2$^+$)	1410.08	4$^+$			%Iγ=0.52 *4*
1924.6[e] *3*	0.30 *4*	3334.7?		1410.08	4$^+$			%Iγ=0.176 *26*
1940.30 *14*	1.04 *7*	5122.48	(1,2,3)	3182.21	(2$^+$)			%Iγ=0.61 *6* E_γ: 1940.49 *15* (2016To01).
1980.4 *5*	0.33 *6*	5122.48	(1,2,3)	3141.51	1$^+$			%Iγ=0.19 *4*
2040.70 *25*	0.50[a] *8*	3951.89	1$^-$	1911.09	0$^+$	[E1]	0.00071	%Iγ=0.29 *5* E_γ: 2039.40 (2016To01). Measured branching ratio from 2016To01: Iγ(2040):Iγ(2843):Iγ(3389)=7.1 *12*:35.6 *60*:57.3 *98*.
2073.75 *7*	6.43 *16*	3182.21	(2$^+$)	1108.45	2$^+$			%Iγ=3.76 *23* E_γ: 2073.65 *15* (2016To01).
2091.9 *4*	0.27 *6*	2654.51		562.93	2$^+$			%Iγ=0.16 *4*
2129.46 *8*	3.34 *10*	2692.40	3$^-$	562.93	2$^+$			%Iγ=1.95 *13*
2185.20 *17*	0.75 *6*	2747.76	(2)$^+$	562.93	2$^+$			%Iγ=0.44 *4*
2203.86 *16*	2.08 *15*	3312.33	3$^-$	1108.45	2$^+$			%Iγ=1.22 *11*
2214.36 *8*	3.39 *10*	3322.85	(2$^+$)	1108.45	2$^+$			%Iγ=1.98 *13*
2278.80 *17*	0.67 *5*	2841.57	2$^+$	562.93	2$^+$			%Iγ=0.39 *4*
2347.40 *25*	0.66 *7*	3887.05	(3$^-$)	1539.46	3$^+$			%Iγ=0.39 *5*
2356.88 *12*	3.74 *16*	2919.79	1$^+$	562.93	2$^+$			%Iγ=2.19 *16*
2369.8[e] *6*	0.42 *14*	3477.65?	(2$^+$,3)	1108.45	2$^+$			%Iγ=0.25 *8*
2435.6 *3*	0.56 *7*	4719.9	(2$^+$,3,4$^+$)	2284.22	(3)$^-$			%Iγ=0.33 *5*
2476.60 *40*	0.33 *7*	3887.05	(3$^-$)	1410.08	4$^+$			%Iγ=0.19 *4*
2481.1 *4*	0.30 *6*	5663.37	(2$^+$)	3182.21	(2$^+$)			%Iγ=0.18 *4*
[x]2489.6 *4*	0.30 *6*							%Iγ=0.18 *4*
2524.0 *2*	1.21 *8*	3632.75	(2$^+$)	1108.45	2$^+$			%Iγ=0.71 *6*
2578.55 *9*	3.40 *10*	3141.51	1$^+$	562.93	2$^+$			%Iγ=1.99 *13*
2591.0 *4*	0.41 *7*	2591.10	(1$^+$,2$^+$)	0.0	0$^+$			%Iγ=0.24 *4*
2619.20 *10*	3.41 *10*	3182.21	(2$^+$)	562.93	2$^+$			%Iγ=2.00 *13*
2668.8[‡e] *4*	0.24 *5*	3231.8?	4$^+$	562.93	2$^+$			%Iγ=0.140 *30*
2680.9 *3*	0.49 *5*	5522.6	(1,2,3)	2841.57	2$^+$			%Iγ=0.287 *34*
2691.6[e] *4*	0.23[&] *6*	2692.40	3$^-$	0.0	0$^+$	[E3]	0.00050	%Iγ=0.14 *4*
2700.5[e] *4*	0.30 *5*	5883.0?	(1,2,3)	3182.21	(2$^+$)			%Iγ=0.176 *31*

γ(^{76}Ge) (continued)

E_γ	I_γ[b]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[†]	α[c]	Comments
2759.95 *14*	1.67 *8*	3322.85	(2$^+$)	562.93	2$^+$			%Iγ=0.98 *7*
2779.1 *4*	1.21 *12*	3887.05	(3$^-$)	1108.45	2$^+$			%Iγ=0.71 *8*
2782.70[e] *40*	1.53 *12*	4192.9?	(2$^+$,3)	1410.08	4$^+$			%Iγ=0.90 *9*
2843.50 *9*	2.42 *10*	3951.89	1$^-$	1108.45	2$^+$	[E1]	0.00118	%Iγ=1.42 *10* E_γ: 2843.10 (2016To01).
2868.1 *2*	0.53 *7*	5522.6	(1,2,3)	2654.51				%Iγ=0.31 *5*
2882.9[e] *9*	0.21 *7*	6065.2?	(1,2,3)	3182.21	(2$^+$)			%Iγ=0.12 *4*
2914.6[e] *2*	1.12 *9*	3477.65?	(2$^+$,3)	562.93	2$^+$			%Iγ=0.66 *7*
2919.85 *10*	13.8 *5*	2919.79	1$^+$	0.0	0$^+$			%Iγ=8.1 *5*
2970.90 *15*	0.60 *7*	5663.37	(2$^+$)	2692.40	3$^-$			%Iγ=0.35 *5*
2981.2[e] *4*	0.31 *6*	5749.9?	(1,2,3)	2768.76	2$^+$			%Iγ=0.18 *4*
[x]3034.6 *2*	0.79 *8*							%Iγ=0.46 *6*
3069.90 *13*	1.40 *8*	3632.75	(2$^+$)	562.93	2$^+$			%Iγ=0.82 *7*
3130.7[e] *6*	0.32 *6*	4239.4?	(1,2,3)	1108.45	2$^+$			%Iγ=0.19 *4*
3141.40 *10*	6.42 *32*	3141.51	1$^+$	0.0	0$^+$	[M1]		%Iγ=3.76 *28*
3145.3[e] *4*	0.45 *9*	6065.2?	(1,2,3)	2919.79	1$^+$			%Iγ=0.26 *6*
3190.6[e] *3*	0.32 *4*	5883.0?	(1,2,3)	2692.40	3$^-$			%Iγ=0.187 *26*
[x]3275.9 *2*	0.88 *8*							%Iγ=0.52 *6*
[x]3283.6 *5*	0.26 *6*							%Iγ=0.15 *4*
3325.2 *12*	0.17 *9*	3887.05	(3$^-$)	562.93	2$^+$			%Iγ=0.10 *5*
3328.7[e] *8*	0.30 *9*	6021.1?	(1,2,3)	2692.40	3$^-$			%Iγ=0.18 *6*
3334.6[e] *5*	0.29 *6*	3334.7?		0.0	0$^+$			%Iγ=0.17 *4*
3366.5[e] *3*	0.22 *3*	6021.1?	(1,2,3)	2654.51				%Iγ=0.129 *19*
3388.75 *12*	4.29 *25*	3951.89	1$^-$	562.93	2$^+$	[E1]	0.00145	%Iγ=2.51 *21* E_γ: 3388.43 (2016To01).
3402.4[e] *3*	0.20 *3*	4812.5?	(2$^+$,3)	1410.08	4$^+$			%Iγ=0.117 *19*
3465.5[e] *4*	0.21 *4*	5749.9?	(1,2,3)	2284.22	(3)$^-$			%Iγ=0.123 *25*
[x]3496.7 *6*	0.16 *5*							%Iγ=0.094 *30*
3559.5[e] *4*	0.89 *7*	4122.3?	(1,2$^+$)	562.93	2$^+$			%Iγ=0.52 *5*
3675.60[e] *45*	0.68 *7*	4784.1?	(1,2,3)	1108.45	2$^+$			%Iγ=0.40 *5*
3736.90[e] *45*	0.24 *6*	6021.1?	(1,2,3)	2284.22	(3)$^-$			%Iγ=0.14 *4*
3752.10 *50*	0.25 *5*	5663.37	(2$^+$)	1911.09	0$^+$			%Iγ=0.146 *31*
[x]3842.3 *4*	0.14 *3*							%Iγ=0.082 *18*
3913.3[e] *5*	0.19 *4*	4476.5?		562.93	2$^+$			%Iγ=0.111 *24*
[x]3925.2 *2*	0.51 *5*							%Iγ=0.298 *34*
3951.70 *14*	6.43 *50*	3951.89	1$^-$	0.0	0$^+$	[E1]	0.00168	%Iγ=3.8 *4* E_γ: 3951.40 (2016To01).
[x]3994.3 *10*	0.34 *5*							%Iγ=0.199 *31*
4121.8[e] *5*	0.38 *5*	4122.3?	(1,2$^+$)	0.0	0$^+$			%Iγ=0.222 *32*
4253.3 *5*	0.34 *5*	5663.37	(2$^+$)	1410.08	4$^+$			%Iγ=0.199 *31*

$^{76}_{32}$Ge$_{44}$-7

γ(^{76}Ge) (continued)

† From Adopted Gammas.

‡ Placement suggested by the evaluators.

1971Ca39 give 14.0 *10*. In view of Iγ(431γ)/Iγ(976γ)=0.65 *7* adopted from ^{238}U(^{76}Ge,^{76}Ge′γ) (2013To05), the evaluators have adjusted the intensity of this γ ray from 1539 level. In 1971Ca39, either the intensity of 431γ is overestimated or it has another possible placement in the decay scheme. In the spectrum shown by 1971Ca39, the 431γ-ray lies in the region of strong γ rays from contaminants, whereas the 976γ in the spectrum is relatively clear of the contaminants.

@ 913.2 *4* in Adopted dataset taken from ^{238}U(^{76}Ge,^{76}Ge′γ) and (n,n′γ). Value of 911.40 *10* in β^- decay seems discrepant.

& Part of it could be sum line also as suggested by E3 reduced transition probabilities in (p,p′) and (α,α′) (evaluators).

[a] Preliminary value measured in 2014Do08 is ≈0.7.

[b] For absolute intensity per 100 decays, multiply by 0.585 *33*.

[c] 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.

[d] Multiply placed with undivided intensity.

[e] Placement of transition in the level scheme is uncertain.

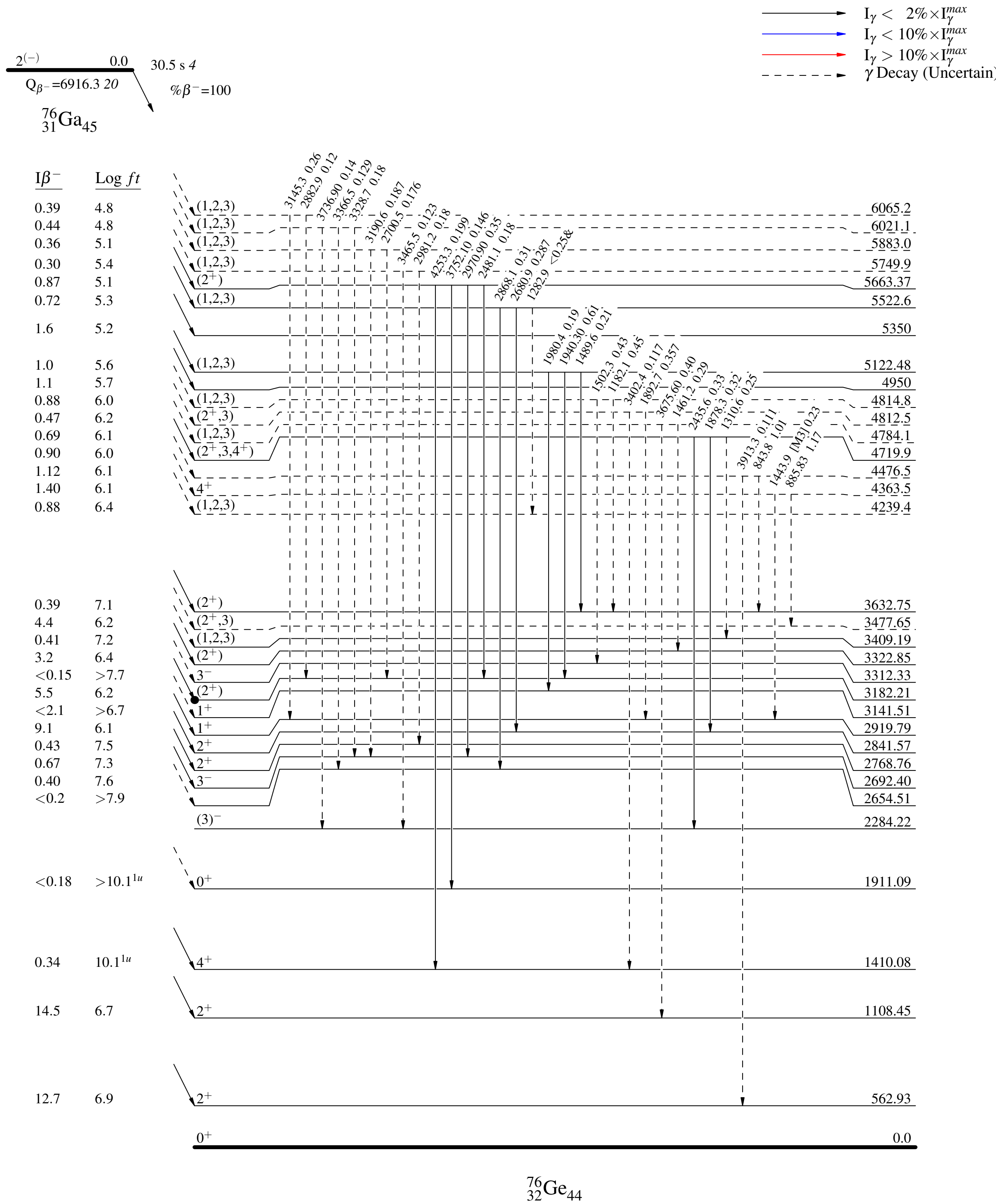
[x] γ ray not placed in level scheme.

$^{76}_{32}Ge_{44}$-8

^{76}Ga β^- decay (30.5 s) 1971Ca39

Decay Scheme

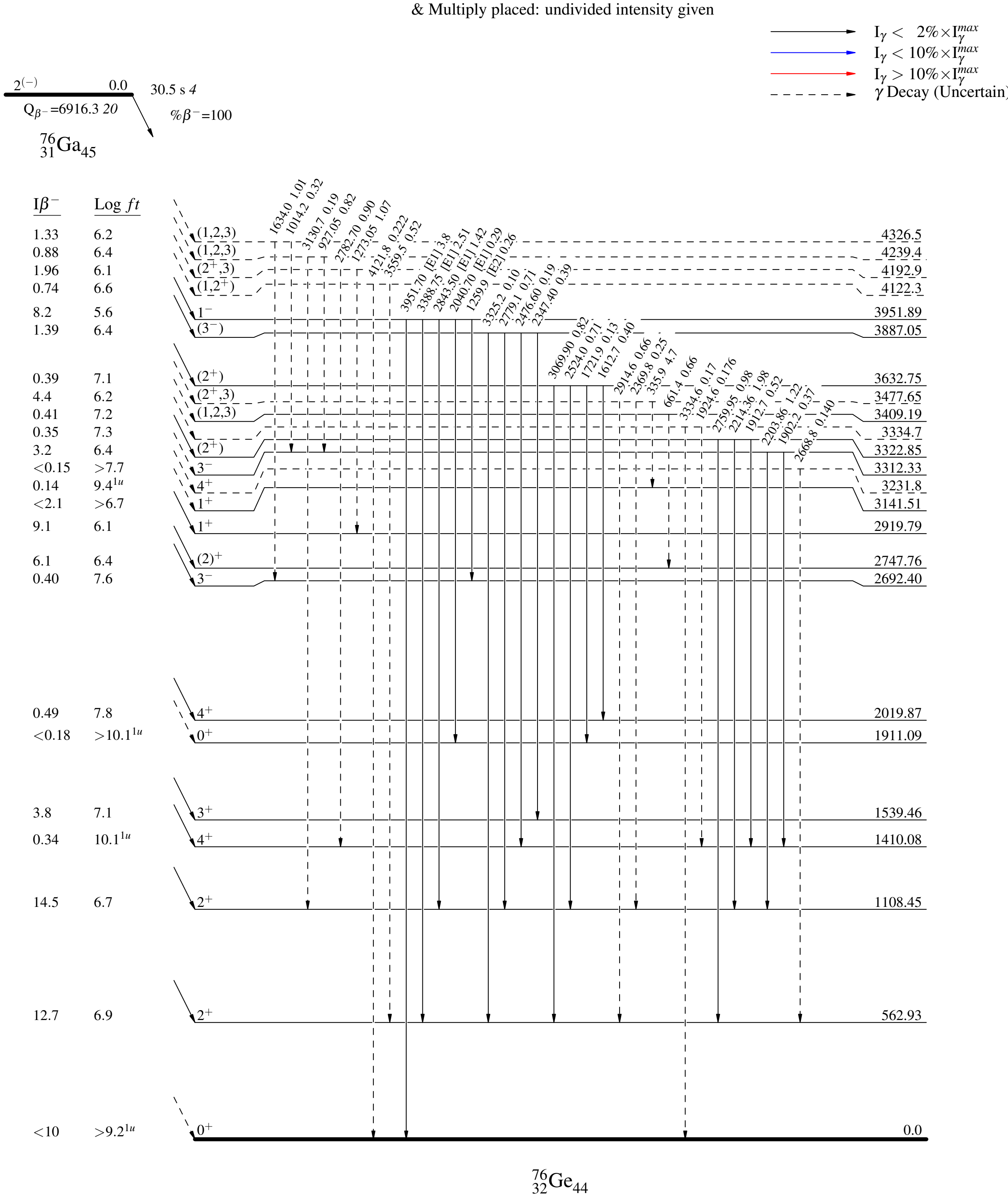
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given



^{76}Ga β^- decay (30.5 s) 1971Ca39

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given



^{76}Ga β^- decay (30.5 s) 1971Ca39

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given