^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 172, 1 (2021)	31-Jan-2021

1988Co18, 1988CoZU: thermal neutron beam was produced from the high- flux reactor of the Institut Laue-Langevin in Grenoble. Target was 96.4% enriched ^{99}Ru. Primary γ rays were detected with a pair spectrometer consisting of a rectangular HPGe crystal with a NaI shield and secondary γ rays were detected with a HPGe detector. Measured Eγ, Iγ. Deduced levels. About 100 γ rays reported in the region 5400-9674, which may all be primary transitions. 1988Co18 listed only 18 primary γ rays in the range 6908-9673.

2000Ge01: measured Eγ, Iγ. Secondary γ's measured with GAMS2/3 curved-crystal spectrometer at Grenoble. Primary γ rays measured with a Ge pair spectrometer. Enriched target. For secondary transitions, 2000Ge01 provide data for selected 63 γ rays, with the statement (see section 3.2.1 in 2000Ge01) that full details will be presented elsewhere. Literature search and enquiry (by evaluators) from one of the authors of 2000Ge01 were unsuccessful to obtain complete information about the secondary transitions. A total of 46 primary transitions in the range 6340-9134 reported.

An enquiry by one of the evaluators on May 3, 2006 from one of the authors (H.G. Borner, Grenoble) of 2000Ge01 requesting details of data for secondary γ rays remained unanswered as of July 31, 2007.

1991Is05: measured primary Eγ (6210-9674 range), Iγ (per 100 neutron captures) using natural ruthenium target, and Ge pair spectrometer. A total of 39 primary γ rays reported with energies (in the range: 6210-9674) and intensities.

Other: 1967Ba79: in this compilation results quoted from a priv. comm. where γ rays were measured with a semi detector using a natural ruthenium target.

J^π(^{99}Ru g.s.)=5/2$^+$ implies J^π(capture state)=2$^+$, 3$^+$.

The level scheme is basically from 1988Co18 with additions proposed by 2000Ge01. Some γ-ray placements are proposed by the evaluators based on other datasets.

The γ-ray energies and cross section data have been measured at Budapest reactor facility with very low (neutron) background during 1999-2003. Detailed reports of this work are available on the IAEA websites: www-nds.iaea.org/pgaa/pgaa7/index.html. See also IAEA publication 2007ChZX and a book by G. Molnar: Handbook of Prompt Gamma Activation Analysis. In this work 59 secondary and 13 primary γ rays are assigned to capture in ^{99}Ru. The strongest secondary and primary (three in each case) from this work are used to compare the intensity scale of the primary and secondary γ rays for absolute (photons/100 neutrons) scale.

σ_n=7.25 b *100* (2018MuZY). Value suggested by the Budapest data is 13.7 b 10.

^{100}Ru Levels

E(level)†	J$^\pi$‡	Comments
0.0	0$^+$	
539.510 *20*	2$^+$	
1130.323 *20*	0$^+$	
1226.479 *20*	4$^+$	
1362.137 *20*	2$^+$	
1741.052 *20*	0$^+$	
1865.135 *20*	2$^+$	
1881.070 *20*	3$^+$	
2051.77 *5*	0$^+$	
2062.659 *20*	4$^+$	
2075.672 *20*	6$^+$	
2099.132 *20*	2$^+$	
2166.904 *20*	3$^-$	γ-ray branching ratios from this level disagree with the adopted values from ^{100}Rh ε decay (20.8 h).
2240.829 *20*	2$^+$	
2351.262 *20*	4$^+$	E(level),J$^\pi$: from 2000Ge01.
2366.610 *20*	4$^+$	
2387.47 *6*	0$^+$	
2413.69 *4*	(4$^+$)	
2469.418 *20*	2$^-$	
2493.04 *4*	(3,4,5$^+$)	
2512.438 *20*	(4)$^+$	

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^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

^{100}Ru Levels (continued)

E(level)[†]	Jπ[‡]	Comments
2516.93 *5*	1⁻	
2527.276 *20*	5⁻	E(level): from 2000Ge01.
2536.226 *20*	3	
2543.64 *4*	2⁺	
2569.917 *20*	(3)⁻	
2576.899 *20*	(5⁺)	E(level),Jπ: from 2000Ge01.
2591.841 *20*	4⁻	
2606.10 *8*	(2,3)	E(level): from 2000Ge01 with J^{π}=(2,3,4).
2617.29 *8*	1,2⁺	E(level): from 2000Ge01.
2660.08 *7*	1,2⁺	
2660.116 *20*	5^(+)	
2665.96 *4*	(2,3)	
2738.700 *20*	(2⁺,3,4⁺)	E(level): level from 2000Ge01 with J^{π}=(3,4).
2747.516[#] *20*		
2764.953 *20*	2⁺,3⁺	
2775.33 *10*	2⁺,3⁺	
2801.81[#] *7*		
2837.53 *20*		
2862.0 *6*		
2877.55[#] *9*	2⁺,3⁺	
2905.3 *3*		
2915.55[#] *8*	2⁻	
2983.31[#] *5*		
2999.40 *12*		
3016.78[#] *16*		
3034.0 *4*		
3064.58 *8*		
3071.6[#] *5*		
3110.56[#] *15*		
3118.7 *4*		
3177.08 *23*		
3231.80 *17*		
3266.3 *3*		
3272.1 *3*		
3300.63[#] *8*		
3308.09 *14*		
3326.28[#] *8*		
3332.41[#] *6*		
3348.43[#] *13*		
3375.02[#] *13*		
3418.5 *7*		
3463.15[#] *13*		
3731.88[#] *13*		
3779.73[#] *13*		
3877.75[#] *17*		
3883.0[#] *3*		
3973.6[#] *5*		
3983.0[#] *7*		
4000.71[#] *20*		
4187.6[#] *3*		

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^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

^{100}Ru Levels (continued)

E(level)[†]	J$^\pi$[‡]
4257.1[#] 3	
(9673.35[&] 2)	2$^+$,3$^+$[@]

[†] From least-squares fit to Eγ data. Normalized χ^2=7.8, higher than the expected value of ≈1.5. About 20 secondary Eγ values out of a total of ≈125 secondary Eγ values are outside three standard deviations, the maximum energy deviation being about 0.6 keV, but mostly around 0.2-0.3 keV, i.e. about 3 times the quoted uncertainty. Increasing minimum uncertainty to 0.1 keV improved the fit only marginally with χ^2≈4, but still about about 16 Eγ values remained outside 3σ. The evaluators have increased the level energy uncertainty to a minimum of 0.02 keV to, partially, take into account the systematic uncertainties.

[‡] From the Adopted Levels, unless otherwise noted.

[#] Proposed by evaluators on the basis of primary γ rays reported in (n,γ) E=res.

[@] s-wave neutron capture in ^{99}Ru g.s. (J^π=5/2$^+$).

[&] From least-squares adjustment of the present γ-ray data. Others: 9673.32 3 (2017Wa10), 9673.30 3 (2000Ge01), 9672.73 6 (1988Co18), 9673.48 5 (1991Is05).

γ(^{100}Ru)

Iγ normalization: intensities quoted by 2000Ge01 per 100 neutron captures are within 10% of those quoted by 1988CoZU, although, the values in 1988CoZU are systematically (≈8%) higher but well within the quoted uncertainties. Normalization in 2000Ge01 assumes that 95% of the ground-state population has been observed. Thus an overall 10% uncertainty to the normalization factor is assigned by the evaluators. From Budapest, cross section=12.0 b 10 for 539.5γ and thermal neutron capture cross section=7.2 b 10 (2006MuZX), Iγ normalization=1.9. Thus the Budapest γ-ray cross section measurement suggests that σ(thermal) should be about two times that given by 2018MuZY. To obtain absolute cross sections (in units of barn) for photon intensity of a γ ray in ^{99}Ru thermal neutron capture, multiply the intensity given in this dataset by a factor of 0.138 12.

E$_\gamma$[†]	I$_\gamma$[‡r]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Comments
[x]155.93 7	1.66 21					
[x]198.94 6	1.57 19					
[x]206.98 9	0.38 5					
[x]236.22 8	0.51 7					
240.549[@] 8	0.056[@] 5	2591.841	4$^-$	2351.262	4$^+$	E$_\gamma$: level-energy difference=240.579.
[x]248.25 6	1.77 22					
288.81[ht] 10	0.18 3	2387.47	0$^+$	2099.132	2$^+$	
295.49[n] 8	0.29 4	2536.226	3	2240.829	2$^+$	
301.769[#g] 1	1.182[#i] 19	2166.904	3$^-$	1865.135	2$^+$	Eγ=302.07 6, Iγ=2.4 3 (1988Co18).
302.522[@] 8	0.061[@] 4	2469.418	2$^-$	2166.904	3$^-$	
329.058[@] 12	0.027[@] 4	2569.917	(3)$^-$	2240.829	2$^+$	
345.518[@] 12	0.043[@] 7	2512.438	(4)$^+$	2166.904	3$^-$	
358.080[@] 9	0.040[@] 4	2099.132	2$^+$	1741.052	0$^+$	
360.373[a] 5	0.144 9	2527.276	5$^-$	2166.904	3$^-$	Eγ=360.67 7, Iγ=0.38 5 (1988Co18).
370.283[@] 5	0.079[@] 8	2469.418	2$^-$	2099.132	2$^+$	
372.090[@] 4	0.080[@] 4	2738.700	(2$^+$,3,4$^+$)	2366.610	4$^+$	
375.686[@] 8	0.046[@] 3	2240.829	2$^+$	1865.135	2$^+$	
379.10 10	0.22 3	1741.052	0$^+$	1362.137	2$^+$	
[x]384.48 7	0.55 7					
387.436[a] 3	0.089 3	2738.700	(2$^+$,3,4$^+$)	2351.262	4$^+$	Eγ=387.77 13, Iγ=0.09 1 (1988Co18).
[x]391.56 13	0.10 2					

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^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

γ(^{100}Ru) (continued)

Eγ[†]	Iγ[‡r]	Ei(level)	J^{π}_{i}	Ef	J^{π}_{f}	Mult.	Comments
398.6 *4*	0.10 *3*	2764.953	2+,3+	2366.610	4+		
[x]400.79 *19*	0.19 *4*						
403.013[#] *10*	1.88[#] *9*	2569.917	(3)−	2166.904	3−		Eγ=403.28 *6*, Iγ=2.7 *3* (1988Co18).
413.43[n] *7*	0.21 *3*	2512.438	(4)+	2099.132	2+		
413.703[@] *19*	0.0267[@] *21*	2764.953	2+,3+	2351.262	4+		
424.874[#] *18*	0.86[#] *10*	2591.841	4−	2166.904	3−		Eγ: level-energy difference=424.936. Eγ=425.09 *6*, Iγ=1.31 *16* (1988Co18).
430.61 *7*	0.54 *7*	2493.04	(3,4,5+)	2062.659	4+		Eγ: level-energy difference=430.38.
[x]439.9 *3*	0.04 *1*						
[x]446.37[l] *7*	0.28 *3*						
450.04 *19*	0.04 *1*	2512.438	(4)+	2062.659	4+		
451.58[@] *3*	0.0298[@] *25*	2527.276	5−	2075.672	6+		
465.148[@] *17*	0.054[@] *4*	2516.93	1−	2051.77	0+		
470.188[@] *17*	0.030[@] *3*	2351.262	4+	1881.070	3+		
470.82[@] *3*	0.059[@] *7*	2569.917	(3)−	2099.132	2+		
485.547[@] *15*	0.059[@] *8*	2366.610	4+	1881.070	3+		
486.121[@] *5*	0.098[@] *5*	2351.262	4+	1865.135	2+		
503.09 *10*	0.21 *3*	1865.135	2+	1362.137	2+		
519.11 *13*	1.38 *22*	1881.070	3+	1362.137	2+		
539.508[#] *2*	87.6[#] *3*	539.510	2+	0.0	0+		Eγ=539.66 *6*, Iγ=100 *12* (1988Co18).
[x]544.63 *13*	0.08 *1*						
[x]558.77 *13*	0.06 *1*						
560.95[a] *8*	0.048 *5*	2660.08	1,2+	2099.132	2+		Eγ=560.95 *8*, Iγ=0.13 *2* (1988Co18).
[x]568.12 *15*	0.04 *1*						
580.600[a] *11*	0.363 *25*	2747.516		2166.904	3−		Eγ=580.71 *7*, Iγ=0.28 *3* (1988Co18).
588.47 *8*	0.53 *7*	2469.418	2−	1881.070	3+		
590.765[#] *9*	2.61[#] *17*	1130.323	0+	539.510	2+		Eγ=590.93 *6*, Iγ=2.4 *3* (1988Co18). Eγ: level-energy difference=590.812.
[x]596.01 *7*	0.22 *3*						
598.19[s] *6*	0.63[s] *8*	2660.116	5(+)	2062.659	4+		Eγ: level-energy difference=597.45.
598.19[sf] *6*	0.63[s] *8*	2764.953	2+,3+	2166.904	3−		
[x]600.47 *22*	0.04 *1*						
[x]602.92 *15*	0.03 *1*						
[x]608.58 *8*	0.06 *1*						
611		1741.052	0+	1130.323	0+	(E0)	
612.03 *6*	0.20 *2*	2493.04	(3,4,5+)	1881.070	3+		
627.83[t] *8*	0.30 *4*	2493.04	(3,4,5+)	1865.135	2+		Placement of this γ to 2+ state is considered questionable by the evaluators, since with the reported intensity in (n,γ) E=th, it should have been seen in other studies.
631.393[#] *20*	0.86[#] *5*	2512.438	(4)+	1881.070	3+		Eγ=631.51 *6*, Iγ=0.95 *11* (1988Co18).
[x]637.03 *13*	0.06 *1*						
638.70 *7*	0.26 *3*	1865.135	2+	1226.479	4+		
[x]642.97 *8*	0.09 *1*						
[x]648.36 *8*	0.10 *1*						
651.88 *7*	0.21 *3*	2516.93	1−	1865.135	2+		
654.587[#] *17*	0.91[#] *5*	1881.070	3+	1226.479	4+		Eγ=654.69 *6*, Iγ=0.80 *10* (1988Co18).
655.156[@] *12*	0.080[@] *5*	2536.226	3	1881.070	3+		
[x]658.18 *14*	0.04 *1*						
662.54 *17*	0.02 *1*	2543.64	2+	1881.070	3+		
[x]668.54 *8*	0.12 *2*						
671.2 *3*	0.02 *1*	2536.226	3	1865.135	2+		

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^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

γ(^{100}Ru) (continued)

E_γ[†]	I_γ[‡r]	E_i(level)	J^π_i	E_f	J^π_f	Comments
676.071[a] 21	0.119 11	2738.700	(2+,3,4+)	2062.659	4+	Eγ=675.95 9, Iγ=0.09 1 (1988Co18).
678.60 7	0.17 2	2543.64	2+	1865.135	2+	
686.972[#] 3	29.82[#] 15	1226.479	4+	539.510	2+	Eγ=687.00 6, Iγ=26 3 (1988Co18).
688.89[@] 3	0.073[@] 6	2569.917	(3)−	1881.070	3+	
695.783[a] 21	0.255 18	2576.899	(5+)	1881.070	3+	Eγ=696.00 9, Iγ=0.23 3 (1988Co18).
700.52 6	0.93 11	2062.659	4+	1362.137	2+	
[x]708.71 11	0.20 3					
710.771[#] 3	1.60[#] 9	2591.841	4−	1881.070	3+	Eγ=710.86 6, Iγ=1.63 20 (1988Co18).
734.789[#] 7	1.25[#] 3	1865.135	2+	1130.323	0+	Eγ=734.85 6, Iγ=1.17 14 (1988Co18).
737.20 13	0.17 3	2099.132	2+	1362.137	2+	
[x]756.15 9	0.18 3					
[x]757.57 17	0.08 2					
[x]763.16 11	0.03 1					
[x]765.90 8	0.05 1					
[x]770.32 12	0.05 1					
[x]773.00 7	0.13 2					
775.97 23	0.02 1	2516.93	1−	1741.052	0+	
778.980[a] 14	0.206 7	2660.116	5(+)	1881.070	3+	E_γ: level-energy difference=779.042. Eγ=779.46 8, Iγ=0.40 5 (1988Co18).
[x]783.14 8	0.29 4					
804.96 7	0.19[j] 2	2166.904	3−	1362.137	2+	
[x]810.79 13	0.04 1					
[x]815.91 7	0.12 1					
822.614[#] 10	7.00[#] 24	1362.137	2+	539.510	2+	Eγ=822.61 6, Iγ=5.7 7 (1988Co18).
[x]831.97 7	0.36 4					
836.180[#] 3	1.60[#] 3	2062.659	4+	1226.479	4+	Eγ=836.14 6, Iγ=1.38 17 (1988Co18).
[x]846.70 7	0.65 8					
849.188[#] 7	1.44[#] 3	2075.672	6+	1226.479	4+	Eγ=849.25 6, Iγ=1.24 15 (1988Co18).
857.621[a] 12	0.177 21	2738.700	(2+,3,4+)	1881.070	3+	Eγ=857.93 6, Iγ=0.20 2 (1988Co18).
[x]863.14 6	0.16 2					
866.466[a] 12	0.241 11	2747.516		1881.070	3+	Eγ=866.41 6, Iγ=0.18 2 (1988Co18).
[x]868.92 8	0.06 1					
872.71[@] 5	0.037[@] 3	2099.132	2+	1226.479	4+	
873.66[a] 5	0.086 4	2738.700	(2+,3,4+)	1865.135	2+	Eγ=873.84 8, Iγ=0.09 1 (1988Co18).
878.55[@] 9	0.024[@] 3	2240.829	2+	1362.137	2+	
[x]880.3[k] 3	0.01 1					
882.63[@] 16	0.011[@] 3	2747.516		1865.135	2+	
883.88 9	0.04 1	2764.953	2+,3+	1881.070	3+	
[x]887.86 7	0.11 1					
[x]891.96 11	0.04 1					
[x]894.44 14	0.03 1					
899.87 10	0.04 1	2764.953	2+,3+	1865.135	2+	
[x]903.08 13	0.04 1					
[x]905.09 7	0.12 1					
[x]910.30 15	0.03 1					
[x]912.65 9	0.06 1					
[x]920.01 7	0.11 1					
[x]922.28 9	0.05 1					
[x]929.37 12	0.07 1					
[x]934.39 6	0.62 7					
940.75 8	0.12 2	2166.904	3−	1226.479	4+	E_γ: level-energy difference=940.42.
[x]943.42 7	0.29 3					
[x]946.18 16	0.05 1					

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^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

γ(^{100}Ru) (continued)

Eγ[†]	Iγ[‡r]	Ei(level)	J^π_i	Ef	J^π_f	Mult.	Comments
[x]950.77 14	0.04 1						
[x]959.4[k] 5	0.01 1						
[x]961.2 3	0.02 1						
[x]966.09 7	0.15 2						
968.80[a] 5	0.065 4	2099.132	2+	1130.323	0+		Eγ=968.31 11, Iγ=0.05 1 (1988Co18).
[x]972.48 10	0.04 1						
[x]982.79 6	0.28 3						
[x]988.24 13	0.06 1						
[x]990.34 17	0.04 1						
[x]993.52 6	0.25 3						
[x]997.05 7	0.17 2						
[x]999.56 24	0.03 1						
[x]1002.00 11	0.07 1						
[x]1010.69 10	0.09 1						
1013.69[ght] 7	0.25 3	2240.829	2+	1226.479	4+		Eγ: level-energy difference=1014.35.
1025.62 9	0.05 1	2387.47	0+	1362.137	2+		Eγ: level-energy difference=1025.32.
[x]1031.69 8	0.05 1						
[x]1041.11 17	0.03 1						
[x]1046.60 11	0.05 1						
1051.57[f] 7	0.10 1	2413.69	(4+)	1362.137	2+		
[x]1056.11 18	0.02 1						
[x]1060.81 21	0.02 1						
[x]1066.99 10	0.04 1						
[x]1071.89 15	0.03 1						
[x]1074.17 7	0.09 1						
[x]1078.02 8	0.04 1						
[x]1083.90 18	0.03 1						
[x]1086.32 19	0.03 1						
[x]1090.26 7	0.10 1						
[x]1099.85 16	0.05 1						
[x]1102.04 9	0.15 2						
[x]1104.35 13	0.08 1						
1107.07 6	0.76 9	2469.418	2−	1362.137	2+		Eγ: level-energy difference=1107.27.
[x]1118.52 13	0.07 1						
1124.768[a] 5	1.30 7	2351.262	4+	1226.479	4+		Eγ=1124.62 6, Iγ=0.93 11 (1988Co18).
[x]1128.64 21	0.06 1						
1130		1130.323	0+	0.0	0+	(E0)	
[x]1133.58 13	0.16 2						
[x]1136.0 4	0.04 1						
1139.96 7	0.24 3	2366.610	4+	1226.479	4+		
[x]1146.2 4	0.04 1						
1150.6 3	0.05 1	2512.438	(4)+	1362.137	2+		
1154.21[ft] 13	0.11 2	2516.93	1−	1362.137	2+		
[x]1159.09 16	0.09 2						
1173.99 9	0.05 1	2536.226	3	1362.137	2+		
1181.21[g] 7	0.30 4	2543.64	2+	1362.137	2+		Eγ: level-energy difference=1181.50.
[x]1183.22 17	0.05 1						
[x]1188.38 16	0.03 1						
[x]1193.27 18	0.02 1						
[x]1198.6 9	0.03 2						
1201.44 14	0.17 3	1741.052	0+	539.510	2+		
1207.74 7	0.58 7	2569.917	(3)−	1362.137	2+		
1229.46 12	0.05 1	2591.841	4−	1362.137	2+		
[x]1237.80 11	0.05 1						
[x]1243.37 10	0.05 1						

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^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

γ(^{100}Ru) (continued)

Eγ[†]	Iγ[‡r]	Ei(level)	$J^π_i$	E_f	$J^π_f$	Comments
1255.12[a] *9*	0.12 *5*	2617.29	1,2+	1362.137	2+	Eγ=1255.8 *3*, Iγ=0.05 *1* (1988Co18).
[x]1258.98 *16*	0.12 *2*					
1266.20 *8*	0.53 *7*	2493.04	(3,4,5+)	1226.479	4+	Eγ: level-energy difference=1266.55.
[x]1268.0 *3*	0.09 *2*					
[x]1271.2 *4*	0.04 *1*					
[x]1280.01 *19*	0.03 *1*					
[x]1284.20 *9*	0.08 *1*					
1285.82[@] *15*	0.107[@] *16*	2512.438	(4)+	1226.479	4+	
[x]1296.72 *12*	0.12 *2*					
1300.764[a] *18*	2.19 *13*	2527.276	5−	1226.479	4+	Eγ=1300.58 *6*, Iγ=1.49 *18* (1988Co18).
[x]1304.72 *25*	0.05 *1*					
1309.41 *13*	0.09 *1*	2536.226	3	1226.479	4+	
[x]1322.61 *12*	0.08 *1*					
1325.45 *6*	1.06 *13*	1865.135	2+	539.510	2+	
[x]1330.11 *24*	0.04 *1*					
1341.560[#] *9*	6.40[#] *4*	1881.070	3+	539.510	2+	Eγ=1341.46 *6*, Iγ=4.8 *6* (1988Co18).
1343.49[@] *3*	1.09[@] *8*	2569.917	(3)−	1226.479	4+	Additional information 1.
1350.450[a] *20*	0.319 *17*	2576.899	(5+)	1226.479	4+	Eγ=1350.19 *6*, Iγ=0.26 *3* (1988Co18).
1362.17[#] *3*	4.77[#] *24*	1362.137	2+	0.0	0+	Eγ=1361.96 *6*, Iγ=3.2 *4* (1988Co18).
1365.416[#] *12*	1.13[#] *7*	2591.841	4−	1226.479	4+	Eγ=1365.24 *8*, Iγ=0.73 *9* (1988Co18). Eγ: level-energy difference=1365.353.
[x]1368.52 *21*	0.14 *3*					
[x]1376.43 *8*	0.09 *1*					
[x]1380.51 *6*	0.53 *6*					
1385.86[ft] *8*	0.10 *1*	2516.93	1−	1130.323	0+	Eγ: level-energy difference=1386.61.
[x]1391.09 *10*	0.06 *1*					
[x]1396.0[k] *4*	0.01 *1*					
[x]1401.04 *9*	0.06 *1*					
[x]1404.98 *7*	0.18 *2*					
[x]1408.03 *8*	0.16 *2*					
[x]1410.22 *20*	0.04 *1*					
1413.19 *7*	0.14 *2*	2543.64	2+	1130.323	0+	
[x]1423.31 *8*	0.08 *1*					
[x]1426.65 *8*	0.07 *1*					
1434.21 *7*	0.24 *3*	2660.116	5(+)	1226.479	4+	Eγ: level-energy difference=1433.63.
[x]1438.67 *6*	0.29 *4*					
[x]1442.85 *9*	0.09 *1*					
[x]1448.04 *12*	0.07 *1*					
[x]1451.06 *9*	0.10 *1*					
[x]1456.30 *13*	0.05 *1*					
1461.19[t] *14*	0.07 *1*	2591.841	4−	1130.323	0+	Placement to 1130, 0+ level is questionable, as ΔJ=4 is involved.
[x]1463.40 *20*	0.04 *1*					
[x]1471.7 *3*	0.02 *1*					
[x]1475.19 *12*	0.05 *1*					
[x]1479.05 *9*	0.07 *1*					
[x]1491.52 *23*	0.04 *1*					
[x]1493.48 *14*	0.08 *1*					
[x]1499.65 *8*	0.10 *1*					
[x]1508.7 *3*	0.04 *1*					
1512.01 *8*	0.25 *3*	2051.77	0+	539.510	2+	
[x]1515.33 *8*	0.21 *3*					
1520.64[b] *7*	0.61 *8*	2747.516		1226.479	4+	Eγ: level-energy difference=1521.02.
1523.07[#] *3*	1.54[#] *8*	2062.659	4+	539.510	2+	Eγ=1522.93 *6*, Iγ=1.21 *15* (1988Co18).

Continued on next page (footnotes at end of table)

^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

γ(^{100}Ru) (continued)

E_γ[†]	I_γ[‡r]	E_i(level)	J_i^π	E_f	J_f^π	Comments
1535.12[gnt] 6	0.45 5	2665.96	(2,3)	1130.323	0$^+$	Placement is considered suspect (by evaluators) since with the reported intensity in (n,γ) E=th, it should have been seen in other studies. E_γ: level-energy difference=1535.63.
1538.29 7	0.30 4	2764.953	2$^+$,3$^+$	1226.479	4$^+$	
[x]1542.32 24	0.03 1					
1548.84[ft] 10	0.16 2	2775.33	2$^+$,3$^+$	1226.479	4$^+$	
1553.38[ft] 8	0.22 3	2915.55	2$^-$	1362.137	2$^+$	
1559.37 6	1.02 12	2099.132	2$^+$	539.510	2$^+$	E_γ: level-energy difference=1559.61.
[x]1563.5 7	0.02 1					
[x]1569.4 3	0.02 1					
[x]1573.75 7	0.17 2					
[x]1577.43 18	0.04 1					
[x]1581.58 11	0.07 1					
[x]1585.00 14	0.05 1					
[x]1588.80 9	0.09 1					
[x]1608.52 21	0.02 1					
[x]1611.86 17	0.03 1					
[x]1620.78 12	0.28 4					
[x]1623.25 12	0.33 4					
1627.35[#] 4	5.43[#] 4	2166.904	3$^-$	539.510	2$^+$	Eγ=1627.18 6, Iγ=4.3 5 (1988Co18).
[x]1651.67 6	0.44 5					
[x]1662.54 16	0.03 1					
[x]1671.72 10	0.05 1					
[x]1678.75 10	0.05 1					
[x]1684.25 12	0.13 2					
[x]1685.92 8	0.22 3					
[x]1690.44 6	0.38 5					
1701.14 6	1.00 12	2240.829	2$^+$	539.510	2$^+$	
[x]1705.64 20	0.05 1					
[x]1709.85 9	0.20 2					
[x]1712.45 25	0.05 1					
[x]1716.53 22	0.04 1					
[x]1720.92 16	0.04 1					
[x]1724.26 7	0.17 2					
[x]1740.54 15	0.04 1					
[x]1756.46 7	0.22 3					
[x]1764.02 20	0.06 1					
[x]1768.23 15	0.12 2					
[x]1771.16 14	0.25 3					
[x]1789.94 11	0.13 2					
[x]1798.77 9	0.10 1					
[x]1801.11 13	0.06 1					
[x]1808.53 10	0.10 1					
1811.53[f] 6	0.67 8	2351.262	4$^+$	539.510	2$^+$	E_γ: level-energy difference=1811.73.
[x]1814.73 8	0.12 1					
[x]1820.5 6	0.02 1					
1827.16[#] 4	1.67[#] 13	2366.610	4$^+$	539.510	2$^+$	Eγ=1827.04 6, Iγ=1.39 17 (1988Co18).
[x]1837.78 7	0.10 1					
[x]1842.10 8	0.09 1					
1847.76 7	0.10 1	2387.47	0$^+$	539.510	2$^+$	
[x]1861.17 22	0.10 2					
1865.04 6	1.16 14	1865.135	2$^+$	0.0	0$^+$	
[x]1874.12 6	0.89 11					
1874.15[a] 5	1.05 16	2413.69	(4$^+$)	539.510	2$^+$	Eγ=1874.12 6, Iγ=0.89 11 (1988Co18).

Continued on next page (footnotes at end of table)

^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

γ(^{100}Ru) (continued)

E_γ[†]	I_γ[‡r]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	Comments
[x]1880.5 4	0.06 1						
[x]1883.77 24	0.14 2						
[x]1886.2 3	0.10 2						
[x]1891.81 16	0.03 1						
[x]1895.6 3	0.02 1						
[x]1903.76 8	0.07 1						
[x]1907.12 13	0.04 1						
[x]1912.90 16	0.03 1						
[x]1917.86 11	0.04 1						
[x]1922.03 19	0.02 1						
1929.74 6	0.84 10	2469.418	2$^-$	539.510	2$^+$		
[x]1942.2 3	0.09 2						
[x]1947.29 19	0.17 3						
[x]1964.6 6	0.02 1						
[x]1966.91 22	0.04 1						
1972.96 7	0.31 4	2512.438	(4)$^+$	539.510	2$^+$		
1977.69 13	0.07 1	2516.93	1$^-$	539.510	2$^+$		
[x]1981.1[k] 9	0.01 1						
[x]1984.70 24	0.03 1						
[x]1987.3 3	0.03 1						
1996.69 6	0.90 11	2536.226	3	539.510	2$^+$		
2004.44 7	0.54[p] 7	2543.64	2$^+$	539.510	2$^+$		E_γ: level-energy difference=2004.11.
[x]2019.09 8	0.14 2						
[x]2024.1[k] 11	0.01 1						
2030.54 8	0.15 2	2569.917	(3)$^-$	539.510	2$^+$		
[x]2047.23 19	0.03 1						
2052.60 16	0.03 1	2591.841	4$^-$	539.510	2$^+$		
[x]2061.00 20	0.05 1						
2066.55[a] 8	0.74 5	2606.10	(2,3)	539.510	2$^+$		Eγ=2066.54 6, Iγ=0.68 8 (1988Co18).
[x]2072.1 3	0.05 1						
[x]2078.05 18	0.08 1						
[x]2092.15 10	0.07 1						
2099.4[@] 5	0.10[@] 4	2099.132	2$^+$	0.0	0$^+$		
[x]2100.40 10	0.11 1						
[x]2106.23 7	0.37 5						
[x]2109.03 11	0.15 2						
[x]2112.81 11	0.12 1						
[x]2118.38 18	0.07 1						
2120.55[#] 11	0.39[#] 4	2660.08	1,2$^+$	539.510	2$^+$		Eγ=2121.39 7, Iγ=0.42 5 (1988Co18).
2126.91[go] 6	0.71 9	2665.96	(2,3)	539.510	2$^+$		E_γ: level-energy difference=2126.43.
[x]2130.8 3	0.03 1						
[x]2136.37 17	0.06 1						
[x]2139.76 10	0.21 3						
[x]2142.14 18	0.08 1						
[x]2148.50 7	0.24 3						
2166.94 7	0.59[j] 7	2166.904	3$^-$	0.0	0$^+$	[E3]	
[x]2171.38 21	0.07 1						
[x]2174.6 3	0.05 1						
[x]2180.95 13	0.15 2						
[x]2183.52 21	0.08 1						
[x]2188.67 15	0.08 1						
[x]2195.03 21	0.04 1						
[x]2198.09 8	0.22 3						
[x]2206.34 11	0.09 1						
[x]2209.27 12	0.09 1						

Continued on next page (footnotes at end of table)

^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

γ(^{100}Ru) (continued)

E_γ[†]	I_γ[‡r]	E_i(level)	J^π_i	E_f	J^π_f	Comments
[x]2215.8 4	0.04 1					
[x]2220.28 22	0.12 2					
[x]2236.36 6	0.55 7					
[x]2243.0 3	0.06 1					
[x]2252.49 20	0.05 1					
[x]2255.42 9	0.14 2					
2262.32[et] 7	0.61 7	2801.81		539.510	2^+	
[x]2268.50 8	0.23 3					
[x]2272.21 10	0.18 2					
[x]2276.70 12	0.13 2					
[x]2283.55 7	0.33 4					
[x]2299.23 7	0.67 8					
[x]2306.46 14	0.11 2					
[x]2314.5 5	0.04 1					
[x]2322.69 13	0.08 1					
[x]2334.49 13	0.08 1					
2337.98[et] 22	0.04 1	2877.55	$2^+,3^+$	539.510	2^+	
[x]2347.16 17	0.07 1					
[x]2352.74 13	0.18 2					
[x]2355.23 20	0.10 2					
[x]2361.62 13	0.11 1					
[x]2366.28[m] 8	0.45 5					
[x]2369.13 19	0.10 2					
[x]2376.75[l] 7	0.86 10					
[x]2383.77 15	0.08 1					
[x]2387.99 16	0.08 1					
[x]2393.2 3	0.05 1					
[x]2395.80 13	0.14 2					
[x]2404.6 4	0.05 1					
[x]2408.1 4	0.08 2					
[x]2412.19 8	0.47 6					
[x]2419.04 11	0.26 3					
[x]2426.3 4	0.03 1					
[x]2430.5 3	0.04 1					
[x]2437.75 21	0.10 2					
[x]2440.63 16	0.16 2					
2444.25[et] 8	0.39 5	2983.31		539.510	2^+	E_γ: level-energy difference=2443.78.
[x]2449.93 16	0.09 1					
[x]2460.28 7	1.19 14					
2543.5[@] 3	0.110[@] 23	2543.64	2^+	0.0	0^+	
2617.32[@] 12	0.34[@] 3	2617.29	$1,2^+$	0.0	0^+	
2660.0[@] 4	0.089[@] 25	2660.08	$1,2^+$	0.0	0^+	
3015.90[qt] 14	1.00[q] 12	3016.78		0.0	0^+	
3070.2[qt] 6	0.27[q] 10	3071.6		0.0	0^+	
3332.52[qt] 21	0.76[q] 11	3332.41		0.0	0^+	
3375.5[qt] 3	0.35[q] 8	3375.02		0.0	0^+	
[x]5412.3[&] 3	0.079[&] 15					
5416.1[b] 3	0.077 14	(9673.35)	$2^+,3^+$	4257.1		
[x]5432.86[&] 17	0.112[&] 18					
[x]5441.8[&] 5	0.028[&] 6					
[x]5447.5[&] 4	0.034[&] 7					
5485.6[b] 3	0.064 11	(9673.35)	$2^+,3^+$	4187.6		
[x]5493.3[&] 3	0.047[&] 9					

Continued on next page (footnotes at end of table)

^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

γ(^{100}Ru) (continued)

Eγ[†]	Iγ[‡r]	E$_i$(level)	J$^\pi_i$	E$_f$	Comments
[x]5501.9[&] 3	0.044[&] 9				
[x]5535.0[&] 9	0.022[&] 8				
[x]5551.76[&] 23	0.078[&] 13				
[x]5566.77[&] 15	0.20[&] 3				
[x]5575.6[&] 3	0.045[&] 9				
[x]5632.41[&] 22	0.094[&] 16				
[x]5645.1[&] 3	0.054[&] 11				
[x]5658.63[&] 14	0.080[&] 12				
[x]5666.39[&] 22	0.039[&] 6				
5672.46[b] 19	0.049 8	(9673.35)	2$^+$,3$^+$	4000.71	
[x]5684.6[&] 6	0.045[&] 11				
5690.2[b] 7	0.037 10	(9673.35)	2$^+$,3$^+$	3983.0	
5699.6[b] 5	0.087 19	(9673.35)	2$^+$,3$^+$	3973.6	
[x]5737.66[&] 17	0.23[&] 4				
[x]5749.6[&] 4	0.051[&] 10				
[x]5768.1[&] 3	0.035[&] 6				
[x]5772.9[&] 4	0.041[&] 7				
5790.2[b] 3	0.050 9	(9673.35)	2$^+$,3$^+$	3883.0	
5795.41[b] 16	0.102 16	(9673.35)	2$^+$,3$^+$	3877.75	
[x]5811.97[&] 13	0.20[&] 3				
[x]5821.3[&] 3	0.049[&] 9				
[x]5848.07[&] 20	0.085[&] 14				
[x]5853.5[&] 5	0.029[&] 6				
5893.43[b] 12	0.43 7	(9673.35)	2$^+$,3$^+$	3779.73	
[x]5913.0[&] 3	0.047[&] 9				
[x]5922.4[&] 3	0.052[&] 10				
5941.27[b] 12	0.32 5	(9673.35)	2$^+$,3$^+$	3731.88	
[x]5950.25[&] 20	0.093[&] 15				
[x]5987.47[&] 20	0.084[&] 14				
[x]5994.5[&] 4	0.037[&] 7				
[x]6002.96[&] 13	0.22[&] 3				
[x]6015.7[&] 4	0.031[&] 7				
[x]6028.57[&] 14	0.163[&] 25				
[x]6057.4[&] 4	0.055[&] 12				
[x]6068.9[&] 4	0.056[&] 12				
[x]6128.77[&] 16	0.115[&] 18				
[x]6146.45[&] 14	0.141[&] 22				
[x]6162.04[&] 20	0.067[&] 11				
[x]6199.67[&] 22	0.087[&] 15				
6210.36 4	0.76 3	(9673.35)	2$^+$,3$^+$	3463.15	Eγ,Iγ: from 1991Is05. Eγ=6209.99 12, Iγ=0.62 9 (1988CoZU).
[x]6234.43[&] 16	0.095[&] 15				
[x]6242.21[&] 25	0.044[&] 8				
6254.6[dt] 7	0.036 10	(9673.35)	2$^+$,3$^+$	3418.5	
[x]6280.5[&] 3	0.052[&] 10				

Continued on next page (footnotes at end of table)

^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

γ(^{100}Ru) (continued)

E_γ[†]	I_γ[‡r]	E_i(level)	J^π_i	E_f	J^π_f	Comments
6298.11[b] *12*	0.41 *6*	(9673.35)	$2^+,3^+$	3375.02		
6324.99 *5*	0.428 *11*	(9673.35)	$2^+,3^+$	3348.43		E_γ,I_γ: from 1991Is05. Eγ=6324.70 *12*, Iγ=0.43 *7* (1988CoZU).
6340.72 *5*	1.08 *3*	(9673.35)	$2^+,3^+$	3332.41		Eγ=6340.59 *4* (1991Is05), 6340.45 *11* (1988CoZU). Iγ=1.07 *16* (1988CoZU), 1.119 *15* (1991Is05).
6346.85 *7*	0.344 *13*	(9673.35)	$2^+,3^+$	3326.28		Eγ=6346.95 *5* (1991Is05), 6346.55 *13* (1988CoZU). Iγ=0.34 *5* (1988CoZU), 0.673 *12* (1991Is05).
^{x}6354.9[&] *4*	0.028[&] *6*					
6365.04[c] *13*	0.112 *8*	(9673.35)	$2^+,3^+$	3308.09		Eγ=6364.70 *16*, Iγ=0.133 *21* (1988CoZU).
6372.50 *7*	0.318 *12*	(9673.35)	$2^+,3^+$	3300.63		Eγ=6372.55 *2* (1991Is05), 6372.36 *13* (1988CoZU). Iγ=0.31 *5* (1988CoZU), 0.305 *15* (1991Is05).
6401.0[c] *3*	0.041 *6*	(9673.35)	$2^+,3^+$	3272.1		Eγ=6401.3 *4*, Iγ=0.034 *6* (1988CoZU).
6406.8[c] *3*	0.036 *5*	(9673.35)	$2^+,3^+$	3266.3		Eγ=6407.3 *3*, Iγ=0.036 *6* (1988CoZU).
6441.32[c] *16*	0.074 *7*	(9673.35)	$2^+,3^+$	3231.80		Eγ=6441.33 *16*, Iγ=0.084 *13* (1988CoZU).
6496.04[c] *23*	0.046 *5*	(9673.35)	$2^+,3^+$	3177.08		Eγ=6495.57 *24*, Iγ=0.048 *8* (1988CoZU).
^{x}6509.0[&] *5*	0.019[&] *4*					
^{x}6537.7[&] *6*	0.019[&] *5*					
6554.4[c] *4*	0.024 *4*	(9673.35)	$2^+,3^+$	3118.7		Eγ=6554.0 *5*, Iγ=0.024 *5* (1988CoZU).
6562.55[c] *14*	0.096 *7*	(9673.35)	$2^+,3^+$	3110.56		Eγ=6562.34 *16*, Iγ=0.115 *18* (1988CoZU).
6602.37 *7*	0.230 *7*	(9673.35)	$2^+,3^+$	3071.6		E_γ,I_γ: from 1991Is05; γ not reported by 2000Ge01. Eγ=6601.5 *5*, Iγ=0.89 *19* (1988CoZU).
6608.53[c] *7*	0.267 *11*	(9673.35)	$2^+,3^+$	3064.58		Eγ=6608.40 *23*, Iγ=0.23 *4* (1988CoZU).
6639.1[c] *4*	0.022 *4*	(9673.35)	$2^+,3^+$	3034.0		Eγ=6640.2 *3*, Iγ=0.134 *24* (1988CoZU).
6656.33 *15*	0.079 *6*	(9673.35)	$2^+,3^+$	3016.78		Eγ=6656.53 *7* (1991Is05), 6655.8 *3* (1988CoZU). Iγ=0.15 *3* (1988CoZU), 0.104 *15* (1991Is05).
6673.70[c] *11*	0.124 *8*	(9673.35)	$2^+,3^+$	2999.40		Eγ=6673.5 *3*, Iγ=0.16 *3* (1988CoZU).
6690.06 *6*	0.557 *17*	(9673.35)	$2^+,3^+$	2983.31		E_γ: level-energy difference=6689.79. Eγ=6690.15 *2* (1991Is05), 6689.80 *15* (1988CoZU). Iγ=0.56 *9* (1988CoZU), 0.587 *7* (1991Is05).
^{x}6717.95[dk] *17*	0.027 *4*					
6757.2 *3*	0.062 *11*	(9673.35)	$2^+,3^+$	2915.55	2^-	Eγ=6757.73 *10* (1991Is05), 6757.59 *18* (1988CoZU). Iγ=0.078 *12* (1988CoZU), 0.101 *3* (1991Is05).
6767.8[c] *3*	0.037 *5*	(9673.35)	$2^+,3^+$	2905.3		Eγ=6768.3 *3*, Iγ=0.041 *7* (1988CoZU).
6795.54 *9*	0.197 *10*	(9673.35)	$2^+,3^+$	2877.55	$2^+,3^+$	Eγ=6795.71 *4* (1991Is05), 6795.53 *13* (1988CoZU). Iγ=0.22 *3* (1988CoZU), 0.221 *4* (1991Is05).
6811.1[#] *6*	0.014[#] *4*	(9673.35)	$2^+,3^+$	2862.0		
6835.56 *19*	0.053 *5*	(9673.35)	$2^+,3^+$	2837.53		Eγ=6835.37 *7* (1991Is05), 6835.4 *3* (1988CoZU). Iγ=0.066 *11* (1988CoZU), 0.130 *6* (1991Is05).
6871.62 *20*	0.052 *5*	(9673.35)	$2^+,3^+$	2801.81		Eγ=6872.08 *10* (1991Is05), 6871.67 *24* (1988CoZU). Iγ=0.066 *11* (1988CoZU), 0.062 *11* (1991Is05).
6898.24[dt] *18*	0.35 *5*	(9673.35)	$2^+,3^+$	2775.33	$2^+,3^+$	
6908.29 *15*	0.077 *6*	(9673.35)	$2^+,3^+$	2764.953	$2^+,3^+$	Eγ=6908.54 *5* (1991Is05), 6908.27 *23* (1988Co18). Iγ=0.100 *17* (1988Co18), 0.130 *8* (1991Is05).
6926.00 *18*	0.060 *5*	(9673.35)	$2^+,3^+$	2747.516		Eγ=6925.92 *7* (1991Is05), 6925.79 *22* (1988Co18). Iγ=0.066 *11* (1988Co18), 0.079 *9* (1991Is05).
6934.0[c] *5*	0.017 *4*	(9673.35)	$2^+,3^+$	2738.700	$(2^+,3,4^+)$	Eγ=6934.3 *4*, Iγ=0.026 *5* (1988Co18).
7007.05 *9*	0.176 *9*	(9673.35)	$2^+,3^+$	2665.96	(2,3)	Eγ=7006.83 *4* (1991Is05), 7006.73 *18* (1988Co18). Iγ=0.23 *4* (1988Co18), 0.188 *5* (1991Is05).
7013.4 *5*	0.020 *4*	(9673.35)	$2^+,3^+$	2660.08	$1,2^+$	Additional information 2. Eγ=7012.9 *3*, Iγ=0.025 *2* (1991Is05).
7056.4[c] *6*	0.014 *4*	(9673.35)	$2^+,3^+$	2617.29	$1,2^+$	Eγ=7057.3 *3*, Iγ=0.035 *6* (1988CoZU).
7066.7[c] *3*	0.110 *7*	(9673.35)	$2^+,3^+$	2606.10	(2,3)	Eγ=7066.38 *14*, Iγ=0.136 *21* (1988CoZU).
7081.30 *15*	0.074 *6*	(9673.35)	$2^+,3^+$	2591.841	4^-	Eγ=7081.35 *5* (1991Is05), 7081.14 *16* (1988Co18). Iγ=0.098 *15* (1988Co18), 0.117 *3* (1991Is05).

Continued on next page (footnotes at end of table)

^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

γ(^{100}Ru) (continued)

Eγ[†]	Iγ[‡r]	Ei(level)	J^π_i	E_f	J^π_f	Comments
7103.14 5	0.981 24	(9673.35)	2+,3+	2569.917	(3)−	Eγ=7103.26 23 (1991Is05), 7102.90 13 (1988Co18). Iγ=1.00 15 (1988Co18), 0.983 11 (1991Is05).
7129.65 26	0.039 5	(9673.35)	2+,3+	2543.64	2+	Eγ=7129.67 12 (1991Is05), 7129.0 3 (1988Co18). Iγ=0.049 9 (1988Co18), 0.056 7 (1991Is05).
7136.6 5	0.020 4	(9673.35)	2+,3+	2536.226	3	Eγ=7137.04 14 (1991Is05), 7136.6 6 (1988Co18). Iγ=0.025 6 (1988Co18), 0.032 6 (1991Is05).
7160.66 19	0.057 5	(9673.35)	2+,3+	2512.438	(4)+	Eγ=7160.29 8 (1991Is05), 7160.30 21 (1988Co18). Iγ=0.079 13 (1988Co18), 0.078 3 (1991Is05).
7180.00 9	0.172 9	(9673.35)	2+,3+	2493.04	(3,4,5+)	Eγ=7181.01 7 (1991Is05), 7179.75 15 (1988Co18). Iγ=0.17 3 (1988Co18), 0.232 5 (1991Is05).
7203.40 9	0.177 9	(9673.35)	2+,3+	2469.418	2−	Eγ=7203.77 4 (1991Is05), 7203.42 15 (1988Co18). Iγ=0.18 3 (1988Co18), 0.239 6 (1991Is05).
7259.6 5	0.018 4	(9673.35)	2+,3+	2413.69	(4+)	Eγ=7261.57 19, Iγ=0.12 3 (1991Is05). Note large energy difference of 2 keV between 2000Ge01 and 1991Is05.
7306.28 9	0.171 9	(9673.35)	2+,3+	2366.610	4+	Eγ=7306.48 4 (1991Is05), 7306.19 17 (1988Co18). Iγ=0.18 3 (1988Co18), 0.171 5 (1991Is05).
7432.2 8	0.010 4	(9673.35)	2+,3+	2240.829	2+	Eγ=7432.91 16, Iγ=0.024 2 (1991Is05).
7506.16 6	0.607 18	(9673.35)	2+,3+	2166.904	3−	Eγ=7506.22 2 (1991Is05), 7505.90 13 (1988Co18). Iγ=0.63 10 (1988Co18), 0.610 7 (1991Is05).
7574.00 16	0.067 5	(9673.35)	2+,3+	2099.132	2+	Eγ=7573.94 5 (1991Is05), 7574.06 19 (1988Co18). Iγ=0.078 12 (1988Co18), 0.069 4 (1991Is05).
7610.29 7	0.449 15	(9673.35)	2+,3+	2062.659	4+	Eγ=7610.43 2 (1991Is05), 7610.17 14 (1988Co18). Iγ=0.49 7 (1988Co18), 0.453 6 (1991Is05).
7791.80 9	0.124 5	(9673.35)	2+,3+	1881.070	3+	Eγ=7791.62 5, Iγ=0.213 5 (1991Is05).
7807.96 11	0.078 4	(9673.35)	2+,3+	1865.135	2+	Eγ=7808.03 8 (1991Is05), 7807.6 4 (1988Co18). Iγ=0.16 3 (1988Co18), 0.092 3 (1991Is05).
8310.78 7	0.193 6	(9673.35)	2+,3+	1362.137	2+	Eγ=8310.96 2 (1991Is05), 8310.63 16 (1988Co18). Iγ=0.22 3 (1988Co18), 0.270 3 (1991Is05).
8446.57 8	0.175 6	(9673.35)	2+,3+	1226.479	4+	Eγ=8446.56 2 (1991Is05), 8446.23 21 (1988Co18). Iγ=0.19 3 (1988Co18), 0.199 3 (1991Is05).
8543.8[dt] 5	0.006 2	(9673.35)	2+,3+	1130.323	0+	
9133.21 8	0.181 4	(9673.35)	2+,3+	539.510	2+	Eγ=9133.39 4 (1991Is05), 9133.3 4 (1988Co18). Iγ=0.17 3 (1988Co18), 0.169 3 (1991Is05).
9673.4 3	0.005 1	(9673.35)	2+,3+	0.0	0+	Eγ,Iγ: from 1991Is05. Eγ=9673.2 10, Iγ=0.003 1(1988Co18).

† Secondary Eγ values are from 1988CoZU and/or 1988Co18 and primary Eγ values from 2000Ge01 (recoil-correction removed by evaluators), unless otherwise stated.

‡ Secondary Iγ values are from 1988CoZU and/or 1988Co18 and primary Iγ data are from 2000Ge01, unless otherwise stated. Values quoted 1988CoZU/1988Co18 are divided by 10 for secondaries and 100 for primaries (Eγ>5 MeV), those by 2000Ge01 are divided by 100, to obtain intensities/100 neutrons. Intensities of primary γ rays from 1991Is05 are divided by a factor of 13.0 to adjust these to the same scale as the intensities given here from 2000Ge01 and 1988CoZU.

\# From 2000Ge01. Secondary γ rays measured with GAMS curved-crystal measurement and primary γ rays with a Ge pair spectrometer. Energy uncertainty does not include the uncertainty of the reference line at 686.971 7 (adopted from ^{100}Rh decay) used for calibration.

@ γ from 2000Ge01 only. Energy uncertainty does not include the uncertainty of the reference line at 686.971 7 (adopted from ^{100}Rh decay) used for calibration.

& γ (possibly a primary γ) from 1988CoZU only, not reported by 1991Is05 or 2000Ge01.

a Placement from 2000Ge01.

b γ from 1988CoZU only. Placement proposed by evaluators, based on results from (n,γ) E=res.

c γ not reported by 1991Is05.

Continued on next page (footnotes at end of table)

^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05 (continued)

γ(^{100}Ru) (continued)

[d] From 1991Is05. γ not reported by 2000Ge01 and/or 1988CoZU.
[e] Placement proposed by evaluators, based on energy sum.
[f] Placement proposed by evaluators, based on results from ^{100}Rh ε decay and/or other reaction studies.
[g] Poor fit in the level scheme, deviates by about 0.3 keV.
[h] Placement considered doubtful (evaluators) since this γ is not seen in ^{100}Rh ε decay.
[i] Intensity is too high by a factor ≈10 as compared to results from ^{100}Rh ε decay. Probably a doublet in (n,γ).
[j] Intensity is too high by a factor ≈3 as compared to results from ^{100}Rh ε decay. Probably a doublet in (n,γ).
[k] Uncertain γ ray.
[l] Part of this γ may be from 2915.5 level, as in ^{100}Rh ε.
[m] Placement from 2366 level (1988Co18) is considered incorrect (by evaluators) since $(4)^+$ to 0^+ transition is unexpected and no such γ from 2366 level is reported in ^{100}Rh ε decay (4.6 min).
[n] The placement of this γ may be suspect since with the reported branching in (n,γ) it should have been seen in ^{100}Rh ε decay.
[o] Assignment from 2764 level (1988Co18) is a misprint.
[p] From a comparison of branching ratios to those in ^{100}Rh ε decay only ≈25% of the intensity is from 2543.6 level.
[q] γ from Budapest data available on IAEA website, intensity deduced from normalization to that of the 539.5γ. The placement of this transition is considered as tentative by evaluators and is not included in the Adopted Levels, Gammas dataset.
[r] For intensity per 100 neutron captures, multiply by 1.00 *10*.
[s] Multiply placed with undivided intensity.
[t] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

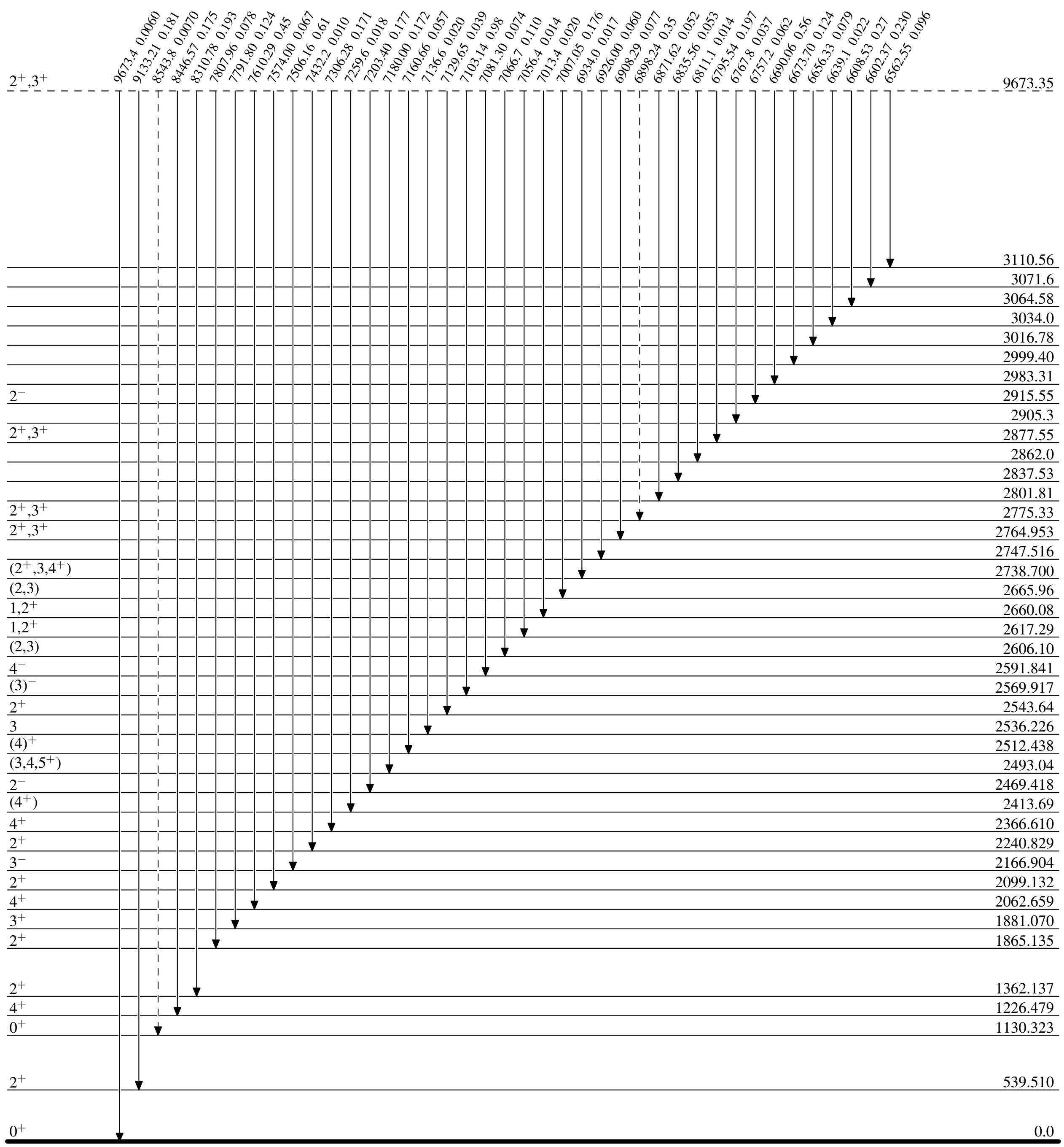
^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05

Legend

Level Scheme

Intensities: Per 100 neutron captures

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



$^{100}_{44}Ru_{56}$

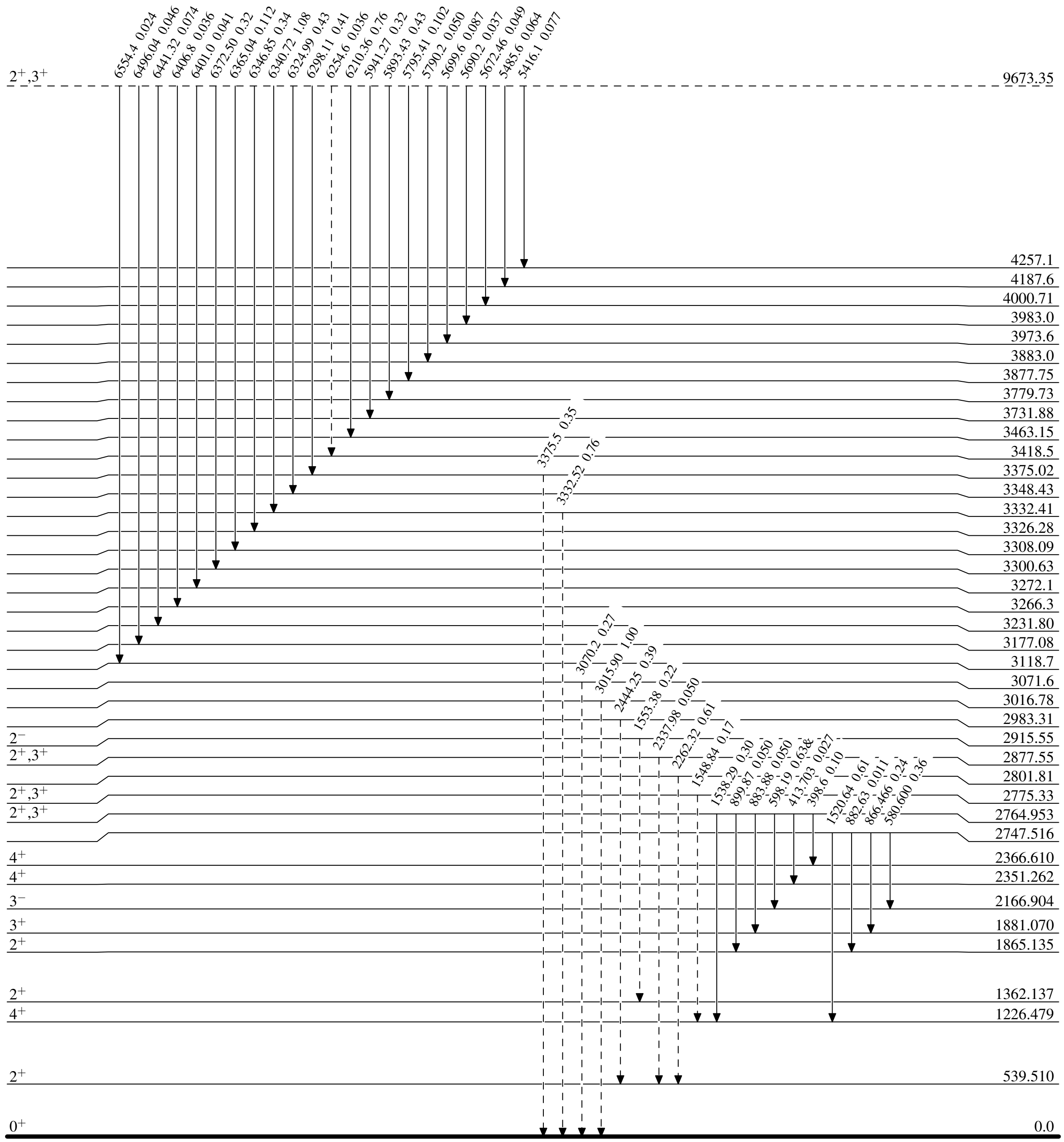
^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05

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)

Level Scheme (continued)

Intensities: Per 100 neutron captures
& Multiply placed: undivided intensity given

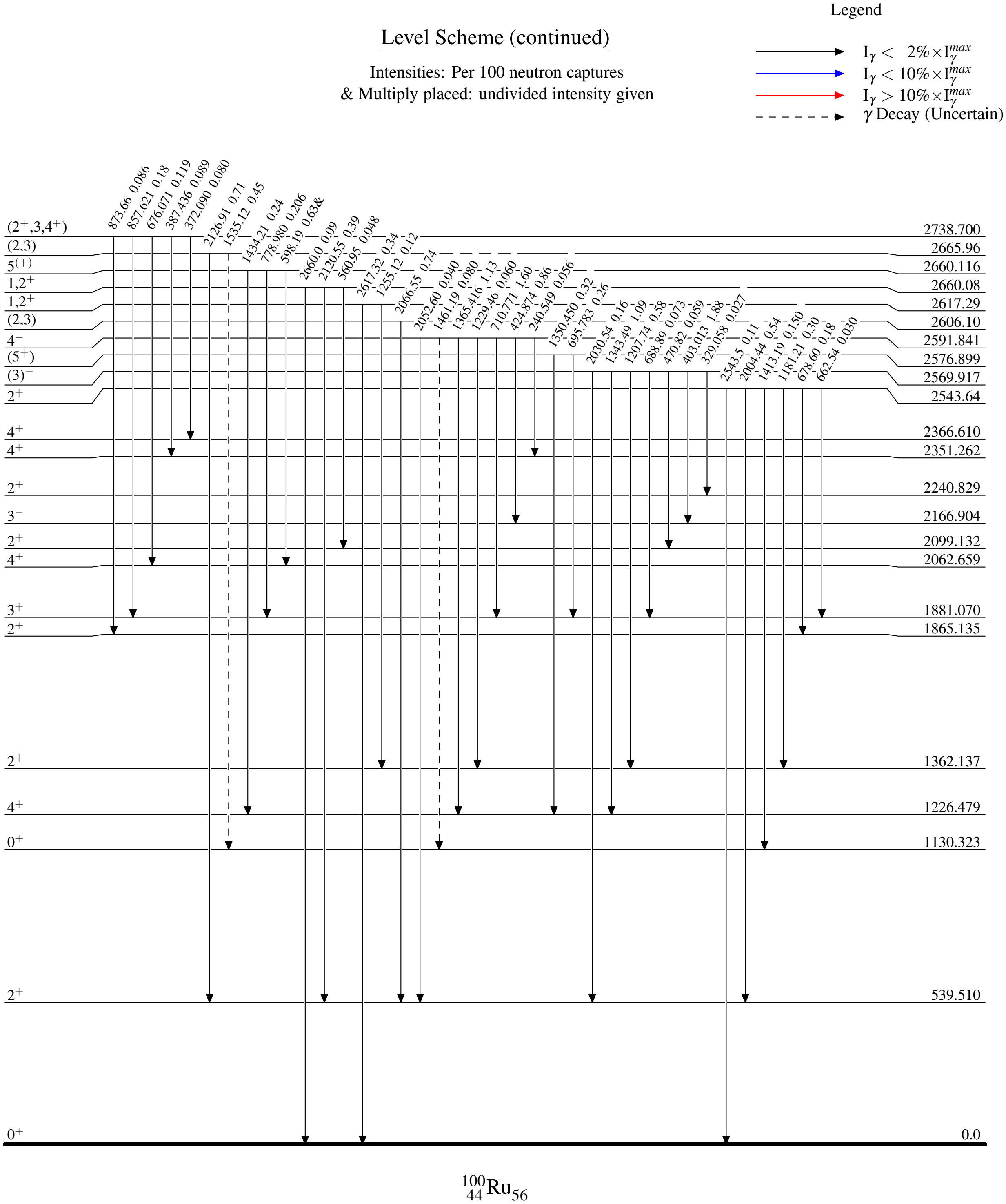


$^{100}_{44}Ru_{56}$

^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05

Level Scheme (continued)

Intensities: Per 100 neutron captures
& Multiply placed: undivided intensity given

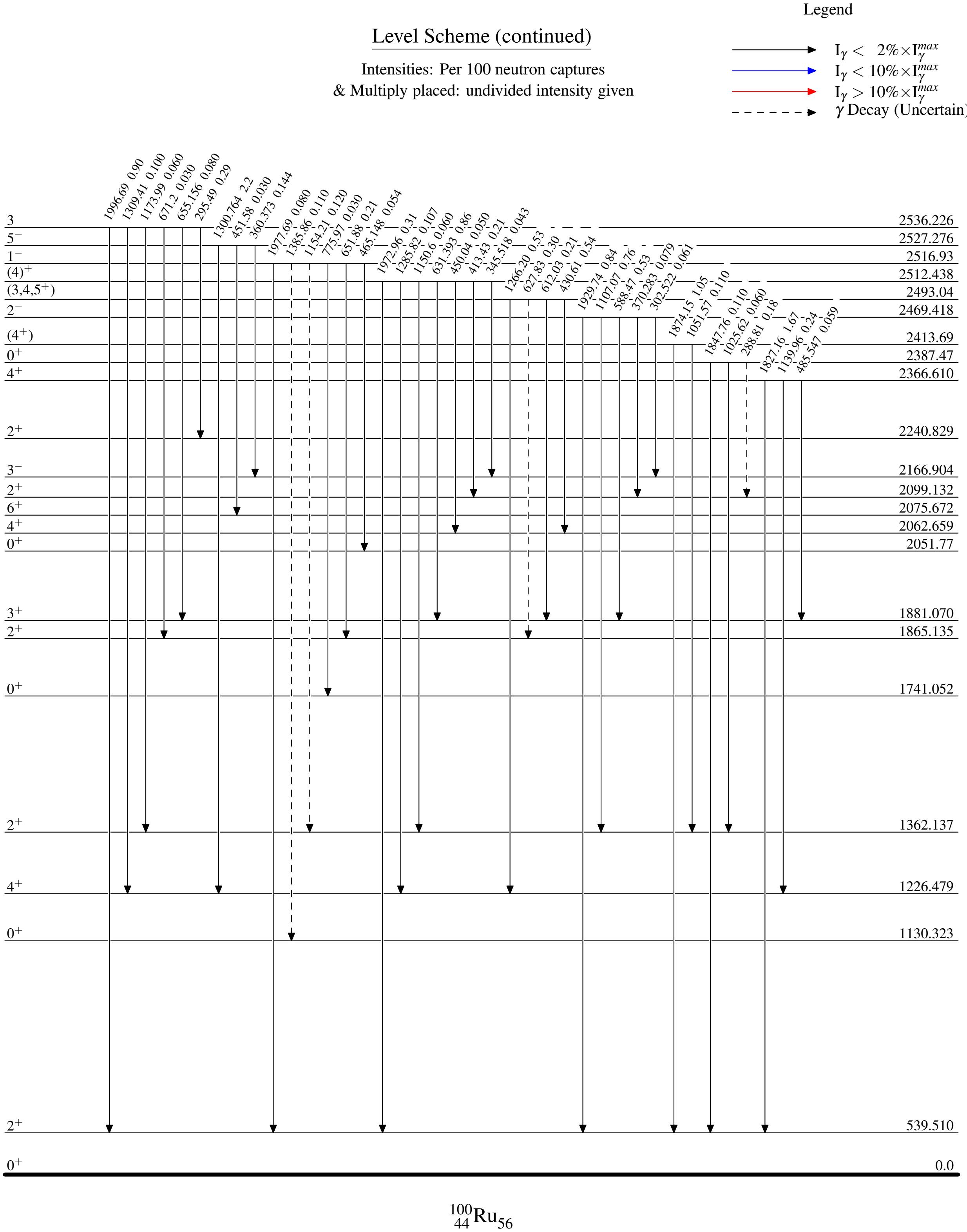


^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05

Level Scheme (continued)

Intensities: Per 100 neutron captures

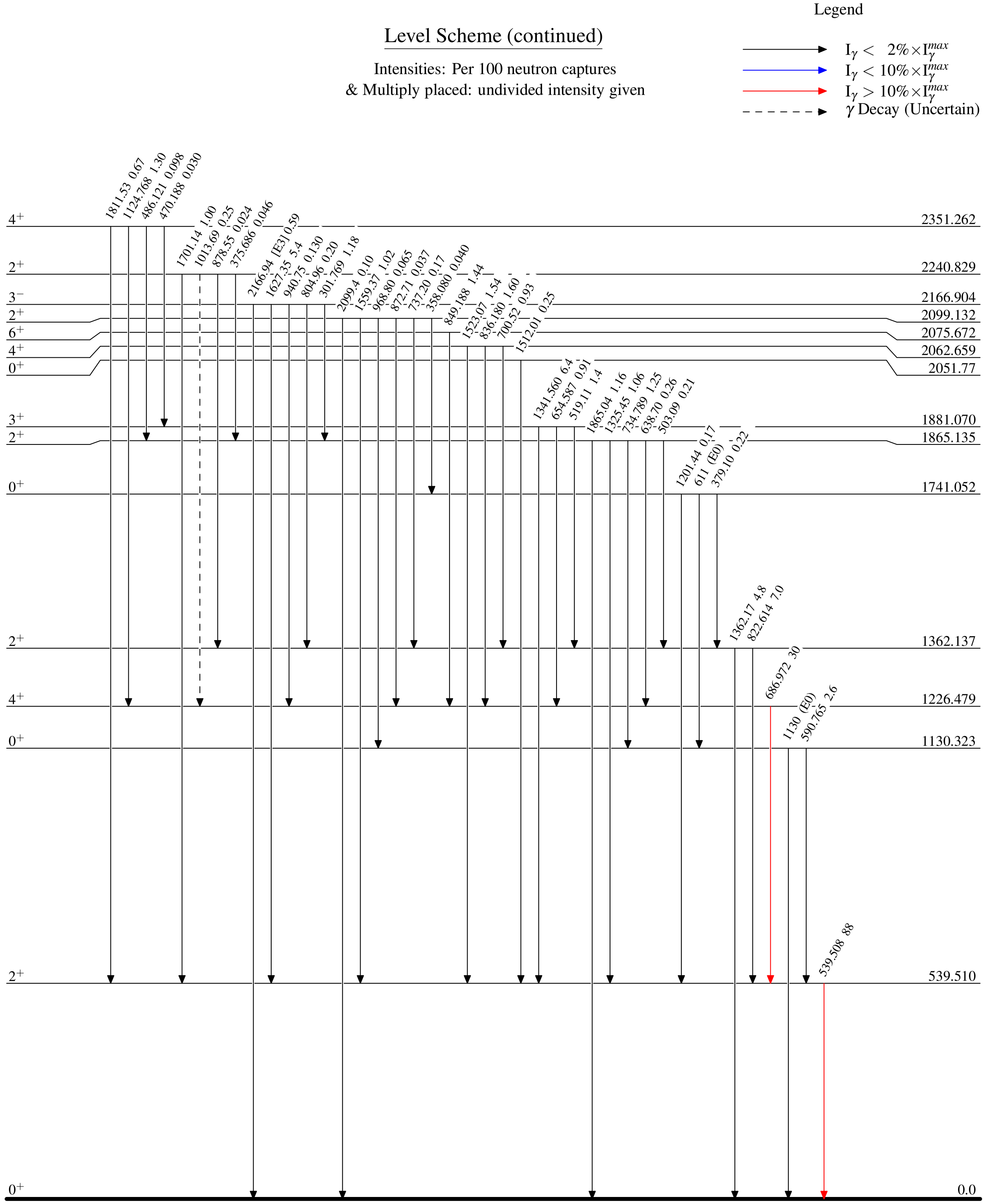
& Multiply placed: undivided intensity given



^{99}Ru(n,γ) E=th 1988Co18,2000Ge01,1991Is05

Level Scheme (continued)

Intensities: Per 100 neutron captures
& Multiply placed: undivided intensity given



$^{100}_{44}Ru_{56}$