^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. Lalkovski, J. Timar and Z. Elekes	NDS 161, 1 (2019)	1-Apr-2019

Parent: ^{105}Tc: E=0.0; J^π=(3/2$^-$); $T_{1/2}$=7.64 min *6*; Q(β^-)=3644 *35*; %β^- decay=100.0

2013Jo02: Facility: K-130 University of Jyvaaskylaa′s cyclotron; Source: from ^{nat}U+p fission and IGISOL separation; Beam: E(p)=30 and 50 MeV; Target: 15 mg/cm^2 thick ^{nat}U; Detectors: Total absorption spectrometer, comprising two large volume cylindrical NaI(Tl) detectors; Measured: γ, β and Eγ.

1975Su02: Source: 1-4 mg/cm^2 chemically separated 1 μCi ^{105}Tc from ^{235}U(n,Fγ) and ^{239}Pu(n,Fγ); Detectors: one planar Ge(Li), one co-axial Ge(Li), one plastic NE102A scintillator; Measured: γ, γ-γ(t) coinc., β-γ coinc., Eγ, Iγ; Deduced: ^{105}Ru level cheme, $T_{1/2}$.

1979Bo26: Facility: high-flux reactor at ILL Grenoble; Target: U_3O_8, enriched to 99.98% in ^{238}U; Beam: thermal neutrons, flux= 5.5⊗10^{14} cm^{-2}s^{-1}; Detectors: curved crystal spectrometers GAMS 1, 2/3; Measured: Eγ; Deduced: isotopic assignment.

1975RaZL: Facility: n-generator at Dep.Phys. at the Univ.Helsinki; Source: chemically separated from U(n,f): Detectors: planar Ge(Li), three co-axial Ge(Li), X-ray Ge(Li) detector with Be window, one NaI(Tl), Pb shields to suppress cross talks between detectors; Measured: γ, γ-γ and β-γ coinc., Eγ, Iγ; Deduced: γ Mult., J^π, level scheme, $T_{1/2}$; Authors suggest additional γ-lines, not presented in the present evaluation, as parts of unresolved multiplets. Some of these are rather background fluctuations.

Others: 1987Gr18, 1977Ki14, 1976KaYO, 1972Ra46, 1972Tr08, 1972TrZT, 1967Ka14, 1963Ki16.

^{105}Ru Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0	3/2$^+$		
20.58 *3*	5/2$^+$	340 ns *15*	$T_{1/2}$: from the slope of 143.25γ-20.55γ(t) coinc. in 1975Su02.
107.945 *8*	5/2$^+$		
159.526 *6*	1/2$^+$		
163.830 *17*	(5/2$^+$)		
229.40 *5*	7/2$^+$		
246.387 *11*	(3/2$^+$,5/2$^+$)		
272.78 *4*	3/2$^+$		
321.66 *4*	3/2$^-$		
340[#]			
441.92 *10*	3/2$^+$,5/2$^+$		
466.37 *7*	3/2$^+$		
500[#]			
578.0 *3*	5/2$^-$		
631.09 *24*	1/2$^+$		
643.92 *23*	(1/2 to 7/2)		
660[#]			E(level): 670.60 *4* in the Adopted Levels. J^π: (1/2$^+$,3/2$^+$) in the Adopted Levels.
756.8 *3*	(3/2,5/2)$^+$		
784.50 *10*	(1/2,3/2)$^-$		
805.8 *5*	1/2$^+$		
824.28 *18*	3/2$^+$		
886.60 *10*	3/2$^+$		
903.14 *10*	3/2$^+$,5/2$^+$		
1325.4 *3*	(1/2,3/2)		
1380[#]			
1420[#]			
1460[#]			
1500[#]			
1540[#]			
1580[#]			E(level): 1581 *10* in the Adopted Levels.

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^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26 (continued)

^{105}Ru Levels (continued)

E(level)[†]	Jπ[‡]	Comments
		Jπ: (3/2+,5/2+) in the Adopted Levels.
1620[#]		
1660[#]		
1700[#]		E(level): 1735.30 *17* in the Adopted Levels. Jπ: (1/2+,3/2+) in the Adopted Levels.
1740[#]		
1780[#]		
1832.67 *17*	(1/2,3/2)	
1843.2 *3*	(1/2,3/2)	
1860[#]		
1900[#]		Jπ: 1930 *10* in the Adopted Levels. Jπ: (3/2+,5/2+) in the Adopted Levels.
1940[#]		
1980[#]		
2020[#]		
2060[#]		
2100[#]		
2155.42 *10*		
2180[#]		
2220[#]		
2260[#]		
2326.7 *4*	(1/2+ to 5/2+)	
2340[#]		E(level): 2352.8 *4* in the Adopted Levels. Jπ: (1/2+,3/2+) in the Adopted Levels.
2403.5 *4*	(3/2+,5/2,7/2−)	
2420[#]		
2460[#]		
2500[#]		
2540[#]		
2580[#]		
2620[#]		
2660[#]		
2700[#]		
2740[#]		
2780[#]		
2820[#]		
2860[#]		
2900[#]		
2940[#]		
2980[#]		
3060[#]		
3100[#]		
3140[#]		
3180[#]		
3220[#]		
3260[#]		

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^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26 (continued)

^{105}Ru Levels (continued)

E(level)†	E(level)†	E(level)†
3300#	3420#	3540#
3340#	3460#	3580#
3380#	3500#	3620#

† From a least-squares fit to Eγ, unless otherwise noted.
‡ From the Adopted Levels.
# Pseudo-levels, from TAGS measurements in 2013Jo02.

β^- radiations

2013Jo02 used a Q(β^-) value of 3746 *6* and placed two pseudo levels at 3700 keV and 3660 keV with Iβ$^-$ of 0.006 and 0.005, respectively. These levels are now above the Q(β^-) value of 2017Wa10, and thus not included here.
Beta feedings are from 2013Jo02. Values from an intensity balance at each level are given in the comments.

E(decay)	E(level)	Iβ$^-$†	Log *ft*	Comments
(2×10^1 *4*)	3620	0.0050	≤4.3	av Eβ=6.1 *92*
(6×10^1 *4*)	3580	0.0057	4.3	av Eβ=16.5 *95*
(1.0×10^2 *4*)	3540	0.0076	4.9	av Eβ=27.4 *99*
(1.4×10^2 *4*)	3500	0.0113	5.1	av Eβ=39 *11*
(1.8×10^2 *4*)	3460	0.0174	5.3	av Eβ=50 *11*
(2.2×10^2 *4*)	3420	0.0268	5.3	av Eβ=63 *11*
(2.6×10^2 *4*)	3380	0.0402	5.4	av Eβ=75 *12*
(3.0×10^2 *4*)	3340	0.0586	5.4	av Eβ=88 *12*
(3.4×10^2 *4*)	3300	0.0281	5.9	av Eβ=101 *12*
(3.8×10^2 *4*)	3260	0.1086	5.5	av Eβ=115 *12*
(4.2×10^2 *4*)	3220	0.1324	5.6	av Eβ=129 *13*
(4.6×10^2 *4*)	3180	0.1493	5.6	av Eβ=143 *13*
(5.0×10^2 *4*)	3140	0.1652	5.7	av Eβ=157 *13*
(5.4×10^2 *4*)	3100	0.1958	5.8	av Eβ=172 *13*
(5.8×10^2 *4*)	3060	0.2697	5.7	av Eβ=186 *14*
(6.6×10^2 *4*)	2980	0.4363	5.7	av Eβ=217 *14*
(7.0×10^2 *4*)	2940	1.2824	5.3	av Eβ=232 *14*
(7.4×10^2 *4*)	2900	1.7774	5.3	av Eβ=248 *14*
(7.8×10^2 *4*)	2860	1.9363	5.3	av Eβ=264 *14*
(8.2×10^2 *4*)	2820	1.7316	5.5	av Eβ=279 *14*
(8.6×10^2 *4*)	2780	1.4357	5.6	av Eβ=296 *15*
(9.0×10^2 *4*)	2740	1.2672	5.7	av Eβ=312 *15*
(9.4×10^2 *4*)	2700	1.2760	5.8	av Eβ=328 *15*
(9.8×10^2 *4*)	2660	1.4413	5.8	av Eβ=345 *15*
(1.02×10^3 *4*)	2620	1.6839	5.8	av Eβ=361 *15*
(1.06×10^3 *4*)	2580	1.9380	5.8	av Eβ=378 *15*
(1.10×10^3 *4*)	2540	2.0856	5.8	av Eβ=395 *15*
(1.14×10^3 *4*)	2500	2.1649	5.9	av Eβ=412 *15*
(1.18×10^3 *4*)	2460	2.2587	5.9	av Eβ=429 *15*
(1.22×10^3 *4*)	2420	2.4394	5.9	av Eβ=446 *15*
(1.24×10^3 *4*)	2403.5	2.6929	5.9	av Eβ=453 *16* Iβ$^-$: 2.1 *4* from I(γ+ce) intensity balance to the level.
(1.30×10^3 *4*)	2340	2.8116	6.0	av Eβ=481 *16*

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^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(1.32×10^3 *4*)	2326.7	2.7775	6.0	av Eβ=486 *16* Iβ$^-$: 6.16 *10* from I(γ+ce) balance.
(1.38×10^3 *4*)	2260	2.8070	6.1	av Eβ=516 *16*
(1.42×10^3 *4*)	2220	3.1258	6.1	
(1.46×10^3 *4*)	2180	3.4730	6.1	av Eβ=551 *16*
(1.49×10^3 *4*)	2155.42	3.1681	6.2	av Eβ=562 *16* Iβ$^-$: 3.3 *5* from I(γ+ce) intensity balance to the level.
(1.54×10^3 *4*)	2100	2.2524	6.4	av Eβ=586 *16*
(1.58×10^3 *4*)	2060	1.4157	6.6	av Eβ=604 *16*
(1.62×10^3 *4*)	2020	0.9572	6.8	av Eβ=622 *16*
(1.66×10^3 *4*)	1980	0.8251	6.9	av Eβ=640 *16*
(1.70×10^3 *4*)	1940	1.1285	6.8	av Eβ=658 *16*
(1.74×10^3 *4*)	1900	2.5773	6.5	av Eβ=676 *16*
(1.78×10^3 *4*)	1860	5.9110	6.2	av Eβ=694 *16*
(1.80×10^3 *4*)	1843.2	6.8953	6.2	av Eβ=701 *16* Iβ$^-$: unresolved doublet in 2013Jo02; 1.1 from I(γ+ce) intensity balance to the level.
≈1800	1832.67	6.8953	6.2	av Eβ=706 *16* Iβ$^-$: unresolved doublet in 2013Jo02; 12.2 *14* from I(γ+ce) intensity balance to the level.
(1.86×10^3 *4*)	1780	3.5053	6.5	av Eβ=730 *16*
(1.90×10^3 *4*)	1740	1.2078	7.0	av Eβ=748 *16*
(1.94×10^3 *4*)	1700	0.4730	7.5	av Eβ=766 *16*
(1.98×10^3 *4*)	1660	0.2486	7.8	av Eβ=785 *16*
(2.02×10^3 *4*)	1620	0.1694	8.0	av Eβ=803 *16*
(2.06×10^3 *4*)	1580	0.1491	8.1	av Eβ=821 *16*
(2.10×10^3 *4*)	1540	0.1685	8.0	av Eβ=840 *16*
(2.14×10^3 *4*)	1500	0.2216	8.0	av Eβ=858 *17*
(2.18×10^3 *4*)	1460	0.3064	7.8	av Eβ=876 *17*
(2.22×10^3 *4*)	1420	0.4742	7.7	av Eβ=895 *17*
(2.26×10^3 *4*)	1380	0.8642	7.5	av Eβ=913 *17*
(2.32×10^3 *4*)	1325.4			Iβ$^-$: 7.36 *15* from I(γ+ce) intensity balance to the level.
(2.74×10^3 *4*)	903.14			Iβ$^-$: 7.48 *7* from I(γ+ce) intensity balance to the level.
(2.76×10^3 *4*)	886.60			Iβ$^-$: 7.11 *7* from I(γ+ce) intensity balance to the level.
(2.82×10^3 *4*)	824.28			Iβ$^-$: 7.9 *3* from I(γ+ce) intensity balance to the level.
(2.84×10^3 *4*)	805.8			Iβ$^-$: 7.80 *8* from I(γ+ce) intensity balance to the level.
(2.86×10^3 *4*)	784.50	4.3247	8.5[1u]	av Eβ=1189 *17* Iβ$^-$: 2.5 *8* from I(γ+ce) intensity balance to the level.
(2.89×10^3 *4*)	756.8	1.7171	7.6	av Eβ=1204 *17* Iβ$^-$: 3.4 *6* from I(γ+ce) intensity balance to the level.
(2.98×10^3 *4*)	660	0.9339	7.4	
(3.00×10^3 *4*)	643.92			Iβ$^-$: 7.26 *8* from I(γ+ce) intensity balance to the level.
(3.07×10^3 *4*)	578.0			Iβ$^-$: 7.41 *7* from I(γ+ce) intensity balance to the level.
(3.14×10^3 *4*)	500	0.5775	8.2	av Eβ=1325 *17*
(3.18×10^3 *4*)	466.37			Iβ$^-$: 7.44 *11* from I(γ+ce) intensity balance to the level.
(3.20×10^3 *4*)	441.92			Iβ$^-$: 7.57 *13* from I(γ+ce) intensity balance to the level.
(3.30×10^3 *4*)	340	5.1187	7.4	av Eβ=1401 *17*
(3.32×10^3 *4*)	321.66			Iβ$^-$: 20 *13* from I(γ+ce) intensity balance to the level.
(3.37×10^3 *4*)	272.78	0.5103	8.4	av Eβ=1433 *17* Iβ$^-$: 6.3 *13* from I(γ+ce) intensity balance to the level.
(3.40×10^3 *4*)	246.387			Iβ$^-$: <12 from I(γ+ce) intensity balance to the level.
(3.41×10^3 *4*)	229.40			Iβ$^-$: 1.6 *3* from I(γ+ce) intensity balance to the level.
(3.48×10^3 *4*)	163.830			Iβ$^-$: 8.4 *17* from I(γ+ce) intensity balance to the level.
(3.48×10^3 *4*)	159.526			Iβ$^-$: 7.4 *20* from I(γ+ce) intensity balance to the level.
(3.54×10^3 *4*)	107.945			Iβ$^-$: 2.6 *23* from I(γ+ce) intensity balance to the level.

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^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(3.62×10^3 *4*)	20.58			
3.80×10^3 *20*	0.0	≤9	≥7.3	av Eβ=1562 *17* Iβ^-: 26.4 from I(γ+ce) intensity balance to the level.

[†] Absolute intensity per 100 decays.

^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26 (continued)

$\gamma(^{105}Ru)$

Iγ normalization: from (100-Iβ_{gs})/I(γ+ce)$_{gs}$, where Iβ_{gs}=9% is from TAGS measurments in 2013Jo02 and I(γ+ce)$_{g.s.}$=4300 *400* is from I(γ+ce) balance to the g.s.

E_γ[†]	I_γ[†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α[&]	Comments
20.55 *5*	10 *5*	20.58	5/2$^+$	0.0	3/2$^+$	M1+E2	0.065 *35*	5.7 *8*	α(L)=5.2 *9*; α(M)=0.96 *16*; α(N+..)=0.153 *22* α(N)=0.148 *22*; α(O)=0.00499 *8* α(N)=0.33 *24*; α(O)=0.00508 *14* δ,α(exp): from the adopted gammas; Others: 6.7 *12* (1978Gu14) and α≈24 (1974Hr01).
51.2[‡] *4*	0.5 *2*	159.526	1/2$^+$	107.945	5/2$^+$	[E2]		14.2 *5*	α(K)=9.08 *25*; α(L)=4.23 *17*; α(M)=0.80 *4*; α(N+..)=0.118 *5* α(N)=0.117 *5*; α(O)=0.00120 *4*
55.74 *5*	5.6 *9*	163.830	(5/2$^+$)	107.945	5/2$^+$	[M1]		1.641	α(K)=1.429 *21*; α(L)=0.1745 *25*; α(M)=0.0321 *5*; α(N+..)=0.00544 *8* α(N)=0.00518 *8*; α(O)=0.000265 *4* α(N)=0.04 *4*; α(O)=0.0006 *4*
75.30 *5*	14 *3*	321.66	3/2$^-$	246.387	(3/2$^+$,5/2$^+$)	[E1+M2]		5 *5*	α(K)=4 *4*; α(L)=0.7 *7*; α(M)=0.13 *13*; α(N+..)=0.022 *21* α(N)=0.021 *21*; α(O)=0.0009 *9*
[x]80.64 *5*	2.8 *9*								
82.546[#] *14*	27 *5*	246.387	(3/2$^+$,5/2$^+$)	163.830	(5/2$^+$)	M1+E2	0.07 *2*	0.542 *10*	α(K)=0.471 *9*; α(L)=0.0584 *17*; α(M)=0.0108 *3*; α(N+..)=0.00182 *5* α(N)=0.00173 *5*; α(O)=8.70×10^{-5} *14*
87.40 *5*	<1	107.945	5/2$^+$	20.58	5/2$^+$	[M1+E2]		1.3 *9*	α(K)=1.0 *7*; α(L)=0.22 *18*; α(M)=0.04 *4*; α(N+..)=0.006 *5* α(N)=0.006 *5*; α(O)=0.00015 *8*
107.945[#] *8*	90 *9*	107.945	5/2$^+$	0.0	3/2$^+$	M1+E2	−0.094 *28*	0.256 *6*	α(K)=0.223 *5*; α(L)=0.0275 *9*; α(M)=0.00507 *17*; α(N+..)=0.00086 *3* α(N)=0.00082 *3*; α(O)=4.11×10^{-5} *8* α(N)=0.0027 *19*; α(O)=8.E−5 *4*
113.36 *5*	5.6 *9*	272.78	3/2$^+$	159.526	1/2$^+$	[M1+E2]		0.5 *3*	α(K)=0.43 *24*; α(L)=0.08 *6*; α(M)=0.014 *11*; α(N+..)=0.0023 *16* α(N)=0.0022 *16*; α(O)=7.E−5 *4*
121.45 *5*	0.9 *4*	229.40	7/2$^+$	107.945	5/2$^+$	[M1+E2]		0.41 *24*	α(K)=0.34 *19*; α(L)=0.06 *4*; α(M)=0.011 *8*; α(N+..)=0.0017 *12* α(N)=0.0017 *12*; α(O)=5.E−5 *3*
[x]131.7[‡] *2*	3.0 *10*								
138.446[#] *7*	27 *3*	246.387	(3/2$^+$,5/2$^+$)	107.945	5/2$^+$	M1+E2	−0.55 *3*	0.190 *6*	α(K)=0.162 *5*; α(L)=0.0236 *10*; α(M)=0.00438 *18*; α(N+..)=0.00071 *3* α(N)=0.00069 *3*; α(O)=2.75×10^{-5} *8* E_γ: underestimated uncertainty as no final level within 0.078 keV.

$^{105}_{44}Ru_{61}$-6

^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26 (continued)

$\gamma(^{105}Ru)$ (continued)

E_γ[†]	I_γ[†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α[&]	Comments
143.26[#] *7*	100	163.830	(5/2$^+$)	20.58	5/2$^+$	M1+E2	0.25 *6*	0.129 *8*	α(K)=0.112 *6*; α(L)=0.0143 *12*; α(M)=0.00263 *22*; α(N+..)=0.00044 *4* α(N)=0.00042 *4*; α(O)=2.01×10^{-5} *9* α(N)=0.0009 *6*; α(O)=3.2×10^{-5} *14*
157.82 *5*	16.8 *19*	321.66	3/2$^-$	163.830	(5/2$^+$)	[E1+M2]			α(K)=0.28 *25*; α(L)=0.04 *4*; α(M)=0.008 *7*; α(N+..)=0.0013 *12* α(N)=0.0012 *12*; α(O)=6.E−5 *6*
159.528[#] *6*	65 *7*	159.526	1/2$^+$	0.0	3/2$^+$	[M1+E2]		0.16 *8*	α(K)=0.14 *7*; α(L)=0.021 *12*; α(M)=0.0039 *23*; α(N+..)=0.0006 *4* α(N)=0.0006 *4*; α(O)=2.3×10^{-5} *9*
162.3 *5*	3.7 *9*	321.66	3/2$^-$	159.526	1/2$^+$	[E1+M2]		0.3 *3*	α(K)=0.25 *23*; α(L)=0.04 *4*; α(M)=0.007 *7*; α(N+..)=0.0012 *11* α(N)=0.0011 *10*; α(O)=5.E−5 *5*
164.8 *5*	1.9 *4*	272.78	3/2$^+$	107.945	5/2$^+$	[M1+E2]		0.15 *7*	α(K)=0.12 *6*; α(L)=0.019 *11*; α(M)=0.0035 *20*; α(N+..)=0.0006 *3* α(N)=0.0005 *3*; α(O)=2.1×10^{-5} *8*
169.2 *5*	3.8 *9*	441.92	3/2$^+$,5/2$^+$	272.78	3/2$^+$	M1+E2	1.0 *+8−4*	0.13 *4*	α(K)=0.11 *3*; α(L)=0.017 *5*; α(M)=0.0031 *10*; α(N+..)=0.00051 *15* α(N)=0.00049 *14*; α(O)=1.9×10^{-5} *4*
193.3 *5*	1.9 *4*	824.28	3/2$^+$	631.09	1/2$^+$	[M1+E2]		0.09 *4*	α(N)=0.0005 *3*; α(O)=1.9×10^{-5} *8* α(K)=0.07 *3*; α(L)=0.010 *6*; α(M)=0.0019 *10*; α(N+..)=0.00032 *15* α(N)=0.00030 *15*; α(O)=1.2×10^{-5} *5*
208.9 *5*	8.4 *9*	229.40	7/2$^+$	20.58	5/2$^+$	[M1+E2]		0.07 *3*	α(K)=0.058 *22*; α(L)=0.008 *4*; α(M)=0.0015 *7*; α(N+..)=0.00024 *11* α(N)=0.00023 *11*; α(O)=1.0×10^{-5} *3*
213.6 *5*	8.4 *9*	321.66	3/2$^-$	107.945	5/2$^+$	E1		0.01579 *25*	α(K)=0.01385 *22*; α(L)=0.001600 *25*; α(M)=0.000292 *5*; α(N+..)=4.92×10^{-5} *8* α(N)=4.68×10^{-5} *8*; α(O)=2.33×10^{-6} *4*
225.6 *1*	18.7 *19*	246.387	(3/2$^+$,5/2$^+$)	20.58	5/2$^+$	M1(+E2)	0.04 *32*	0.034 *5*	α(K)=0.030 *4*; α(L)=0.0035 *6*; α(M)=0.00065 *11*; α(N+..)=0.000111 *18* α(N)=0.000105 *17*; α(O)=5.5×10^{-6} *5*
229.4 *5*	1.9 *9*	229.40	7/2$^+$	0.0	3/2$^+$	[E2]		0.0672 *11*	α(K)=0.0573 *10*; α(L)=0.00820 *14*; α(M)=0.001515 *25*; α(N+..)=0.000246 *4* α(N)=0.000237 *4*; α(O)=9.35×10^{-6} *15*
246.2 *5*	3.8 *9*	246.387	(3/2$^+$,5/2$^+$)	0.0	3/2$^+$				
252.0 *1*	37 *4*	272.78	3/2$^+$	20.58	5/2$^+$	M1(+E2)	11 *+44−4*	0.0484 *8*	α(K)=0.0413 *7*; α(L)=0.00577 *9*; α(M)=0.001065 *17*; α(N+..)=0.000174 *3* α(N)=0.000167 *3*; α(O)=6.82×10^{-6} *11*
272.6 *1*	22 *3*	272.78	3/2$^+$	0.0	3/2$^+$	M1+E2	0.29 *+11−7*	0.0222 *11*	α(N)=0.00012 *5*; α(O)=5.5×10^{-6} *14* α(K)=0.0193 *9*; α(L)=0.00232 *14*; α(M)=0.00043 *3*; α(N+..)=7.2×10^{-5} *4*

$^{105}_{44}Ru_{61}$-7

^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26 (continued)

$\gamma(^{105}Ru)$ (continued)

E_γ[†]	I_γ[†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α[&]	Comments
									α(N)=6.9×10^{-5} *4*; α(O)=3.51×10^{-6} *13* α(N)=0.00010 *4*; α(O)=4.3×10^{-6} *10*
[x]280.2 *1*	6.5 *10*								
282.7 *5*	1.9 *5*	441.92	3/2$^+$,5/2$^+$	159.526	1/2$^+$				
301.0 *5*	7.5 *10*	321.66	3/2$^-$	20.58	5/2$^+$				
307.0 *5*	6.5 *18*	466.37	3/2$^+$	159.526	1/2$^+$	M1+E2		0.020 *5*	α(K)=0.017 *4*; α(L)=0.0022 *7*; α(M)=0.00041 *12*; α(N+..)=6.8×10^{-5} *19* α(N)=6.5×10^{-5} *18*; α(O)=3.0×10^{-6} *6*
314.7 *5*	4.7 *20*	756.8	(3/2,5/2)$^+$	441.92	3/2$^+$,5/2$^+$				
321.5 *1*	71 *10*	321.66	3/2$^-$	0.0	3/2$^+$				
322.3 *5*	10 *3*	643.92	(1/2 to 7/2)	321.66	3/2$^-$				
333.9 *5*	4.7 *25*	441.92	3/2$^+$,5/2$^+$	107.945	5/2$^+$	M1+E2	−0.62 *+4−7*	0.0143 *4*	α(K)=0.0124 *3*; α(L)=0.00152 *5*; α(M)=0.000278 *9*; α(N+..)=4.69×10^{-5} *13* α(N)=4.47×10^{-5} *13*; α(O)=2.21×10^{-6} *5* α(N)=5.0×10^{-5} *12*; α(O)=2.4×10^{-6} *4*
358.3 *1*	16 *3*	466.37	3/2$^+$	107.945	5/2$^+$	M1+E2		0.0127 *23*	α(K)=0.0111 *19*; α(L)=0.0014 *3*; α(M)=0.00025 *6*; α(N+..)=4.2×10^{-5} *9* α(N)=4.0×10^{-5} *9*; α(O)=1.9×10^{-6} *3*
358.4 *5*	3.7 *15*	631.09	1/2$^+$	272.78	3/2$^+$	[M1+E2]		0.0127 *23*	α(K)=0.0110 *19*; α(L)=0.0014 *3*; α(M)=0.00025 *6*; α(N+..)=4.2×10^{-5} *9* α(N)=4.0×10^{-5} *9*; α(O)=1.9×10^{-6} *3*
397.6 *5*	1.8 *9*	643.92	(1/2 to 7/2)	246.387	(3/2$^+$,5/2$^+$)				
[x]407.4 *5*	1.8 *9*								
418.7 *5*	2.8 *10*	578.0	5/2$^-$	159.526	1/2$^+$	[M2]		0.0257	α(K)=0.0223 *4*; α(L)=0.00281 *4*; α(M)=0.000520 *8*; α(N+..)=8.82×10^{-5} *13* α(N)=8.39×10^{-5} *13*; α(O)=4.31×10^{-6} *7*
441.9 *1*	11.2 *20*	441.92	3/2$^+$,5/2$^+$	0.0	3/2$^+$				
445.9 *1*	10.3 *20*	466.37	3/2$^+$	20.58	5/2$^+$	[M1+E2]		0.0068 *7*	α=0.0068 *7*; α(K)=0.0060 *6*; α(L)=0.00072 *10*; α(M)=0.000132 *19*; α(N+..)=2.2×10^{-5} *3* α(N)=2.1×10^{-5} *3*; α(O)=1.06×10^{-6} *8*
462.8 *1*	28 *3*	784.50	(1/2,3/2)$^-$	321.66	3/2$^-$	M1+E2	0.33 *+12−7*	0.00571 *12*	α=0.00571 *12*; α(K)=0.00500 *10*; α(L)=0.000584 *14*; α(M)=0.000107 *3*; α(N+..)=1.82×10^{-5} *4* α(N)=1.73×10^{-5} *4*; α(O)=9.09×10^{-7} *15*
466.3 *5*	9.5 *10*	466.37	3/2$^+$	0.0	3/2$^+$	[M1+E2]		0.0060 *6*	α=0.0060 *6*; α(K)=0.0053 *5*; α(L)=0.00063 *8*; α(M)=0.000116 *15*; α(N+..)=1.96×10^{-5} *22* α(N)=1.87×10^{-5} *22*; α(O)=9.4×10^{-7} *6*
469.9 *5*	2.8 *9*	578.0	5/2$^-$	107.945	5/2$^+$	[E1+M2]		0.010 *9*	α(K)=0.009 *7*; α(L)=0.0011 *9*; α(M)=0.00020 *17*; α(N+..)=3.E−5 *3* α(N)=3.E−5 *3*; α(O)=1.7×10^{-6} *14*
471.7 *5*	2.0 *10*	631.09	1/2$^+$	159.526	1/2$^+$	[M1+E2]		0.0058 *5*	α=0.0058 *5*; α(K)=0.0051 *5*; α(L)=0.00061 *8*; α(M)=0.000113 *14*; α(N+..)=1.90×10^{-5} *21* α(N)=1.81×10^{-5} *20*; α(O)=9.1×10^{-7} *6*

$^{105}_{44}Ru_{61}$-8

$\gamma(^{105}Ru)$ (continued)

E_γ [†]	I_γ [†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α [&]	Comments
480.1 *5*	9.5 *10*	643.92	(1/2 to 7/2)	163.830	$(5/2^+)$				
484.0 *5*	2.8 *5*	756.8	$(3/2,5/2)^+$	272.78	$3/2^+$				
[x]490.6 *1*	15.0 *18*								
535.8 *5*	<1	643.92	(1/2 to 7/2)	107.945	$5/2^+$				
538.5[‡] *5*	2 *1*	784.50	$(1/2,3/2)^-$	246.387	$(3/2^+,5/2^+)$				
540.7 *5*	1.8 *10*	1325.4	(1/2,3/2)	784.50	$(1/2,3/2)^-$				
565.1 *5*	8.4 *10*	886.60	$3/2^+$	321.66	$3/2^-$	[E1+M2]		0.006 *5*	α=0.006 *5*; α(K)=0.005 *4*; α(L)=0.0006 *5*; α(M)=0.00012 *10*; α(N+..)=2.0×10^{-5} *16* α(N)=1.9×10^{-5} *15*; α(O)=1.0×10^{-6} *8*
577.9 *5*	15.0 *18*	578.0	$5/2^-$	0.0	$3/2^+$	[E1+M2]		0.006 *5*	α=0.006 *5*; α(K)=0.005 *4*; α(L)=0.0006 *5*; α(M)=0.00011 *9*; α(N+..)=1.9×10^{-5} *15* α(N)=1.8×10^{-5} *14*; α(O)=9.E−7 *8*
631.0 *5*	1.5 *5*	631.09	$1/2^+$	0.0	$3/2^+$	[M1+E2]		0.00273 *6*	α=0.00273 *6*; α(K)=0.00239 *5*; α(L)=0.000281 *11*; α(M)=5.14×10^{-5} *20*; α(N+..)=8.7×10^{-6} *3* α(N)=8.3×10^{-6} *3*; α(O)=4.28×10^{-7} *7* E_γ: Relative intensities of 358, 472 and 631 γ's deexciting the 631-keV level are not in good agreement with those measured in (n,γ) work: I(358γ): I(472γ); I(631γ)= 1.8 *12*: 1.0: 0.75 *45* here, 2.4 *16*: 1.0: 6.6 *20* in (n,γ) work Values from (n,γ) adopted.
640.2 *1*	16.8 *15*	886.60	$3/2^+$	246.387	$(3/2^+,5/2^+)$	M1+E2	0.20 *2*	0.00260 *4*	α=0.00260 *4*; α(K)=0.00228 *4*; α(L)=0.000262 *4*; α(M)=4.81×10^{-5} *7*; α(N+..)=8.20×10^{-6} *12* α(N)=7.79×10^{-6} *11*; α(O)=4.15×10^{-7} *6*
644.0 *5*	4.7 *9*	643.92	(1/2 to 7/2)	0.0	$3/2^+$				
646.3 *5*	7.5 *9*	805.8	$1/2^+$	159.526	$1/2^+$	[M1+E2]		0.00257 *5*	α=0.00257 *5*; α(K)=0.00225 *4*; α(L)=0.000264 *9*; α(M)=4.84×10^{-5} *17*; α(N+..)=8.20×10^{-6} *23* α(N)=7.80×10^{-6} *23*; α(O)=4.03×10^{-7} *7*
648.7 *5*	4.7 *9*	756.8	$(3/2,5/2)^+$	107.945	$5/2^+$				
657.0 *5*	<1	903.14	$3/2^+,5/2^+$	246.387	$(3/2^+,5/2^+)$				
664.6 *5*	2.7 *10*	824.28	$3/2^+$	159.526	$1/2^+$	[M1+E2]		0.00240 *4*	α=0.00240 *4*; α(K)=0.00210 *3*; α(L)=0.000246 *7*; α(M)=4.50×10^{-5} *13*; α(N+..)=7.64×10^{-6} *18* α(N)=7.27×10^{-6} *18*; α(O)=3.76×10^{-7} *8*
[x]713.8 *5*	3.6 *18*								
716.6 *5*	3.6 *20*	824.28	$3/2^+$	107.945	$5/2^+$	[M1+E2]		0.00199 *4*	α=0.00199 *4*; α(K)=0.00175 *3*; α(L)=0.000203 *4*; α(M)=3.73×10^{-5} *7*; α(N+..)=6.33×10^{-6} *10* α(N)=6.02×10^{-6} *10*; α(O)=3.13×10^{-7} *9*
722.8 *5*	<1	886.60	$3/2^+$	163.830	$(5/2^+)$				
739.3 *1*	10.3 *10*	903.14	$3/2^+,5/2^+$	163.830	$(5/2^+)$				
757.0 *5*	7.5 *10*	756.8	$(3/2,5/2)^+$	0.0	$3/2^+$				
824.3 *5*	7.5 *10*	824.28	$3/2^+$	0.0	$3/2^+$	[M1+E2]		0.00143 *4*	α=0.00143 *4*; α(K)=0.00125 *4*; α(L)=0.000145 *3*; α(M)=2.65×10^{-5} *5*; α(N+..)=4.51×10^{-6} *10* α(N)=4.28×10^{-6} *9*; α(O)=2.25×10^{-7} *9*

$^{105}_{44}Ru_{61}$-9

^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26 (continued)

$\gamma(^{105}Ru)$ (continued)

E_γ †	I_γ †@	E_i(level)	J_i^π	E_f	J_f^π	Comments
883.5 *5*	<1	1325.4	(1/2,3/2)	441.92	$3/2^+$,$5/2^+$	
[x]896.0 *5*	10 *5*					
1003.8 *5*	4.5 *20*	1325.4	(1/2,3/2)	321.66	$3/2^-$	I_γ: relative intensities of 541 and 1004 γ's measured in (n,γ) and ^{105}Tc β^- decay are not consistent: I(541γ)/I(1004γ)=1.2 *4* in (n,γ) work, 0.40 *18* here.
1008.4 *1*	11.2 *10*	1832.67	(1/2,3/2)	824.28	$3/2^+$	
1047.9 *5*	3.7 *19*	1832.67	(1/2,3/2)	784.50	$(1/2,3/2)^-$	
1058.5 *5*	5.6 *20*	1843.2	(1/2,3/2)	784.50	$(1/2,3/2)^-$	
1201.6 *5*	7.5 *9*	1832.67	(1/2,3/2)	631.09	$1/2^+$	
1366.3 *5*	20.6 *20*	1832.67	(1/2,3/2)	466.37	$3/2^+$	
1370.8 *5*	4.5 *10*	2155.42		784.50	$(1/2,3/2)^-$	
1510.6 *5*	15.0 *15*	1832.67	(1/2,3/2)	321.66	$3/2^-$	
1560.1 *5*	13.0 *15*	1832.67	(1/2,3/2)	272.78	$3/2^+$	
1570.5 *5*	<1	1843.2	(1/2,3/2)	272.78	$3/2^+$	
1673.3 *5*	<1	1832.67	(1/2,3/2)	159.526	$1/2^+$	
1683.9 *5*	<1	1843.2	(1/2,3/2)	159.526	$1/2^+$	
1882.7 *5*	1.0 *2*	2155.42		272.78	$3/2^+$	
2053.9 *5*	9.5 *20*	2326.7	($1/2^+$ to $5/2^+$)	272.78	$3/2^+$	
2082.0 *5*	9.5 *20*	2403.5	($3/2^+$,5/2,$7/2^-$)	321.66	$3/2^-$	
2155.4 *1*	14.0 *15*	2155.42		0.0	$3/2^+$	
2167.2 *5*	2.0 *4*	2326.7	($1/2^+$ to $5/2^+$)	159.526	$1/2^+$	
2174.0 *5*	2.8 *4*	2403.5	($3/2^+$,5/2,$7/2^-$)	229.40	$7/2^+$	

† From 1975Su02, unless noted otherwise.
‡ From 1975RaZL. Transition not reported in 1975Su02.
# From measurements with a curved crystal spectrometer (1979Bo26).
@ For absolute intensity per 100 decays, multiply by 0.02116 *20*.
& 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.
[x] γ ray not placed in level scheme.

$^{105}_{44}Ru_{61}$-10

^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26

Decay Scheme

Intensities: Relative I_γ

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- Coincidence

$(3/2^-)$ 0.0 7.64 min 6

Q_{β^-}=3644 35 $\%\beta^-$=100

$^{105}_{43}Tc_{62}$

Iβ⁻	Log *ft*		
0.0050	≤4.3		3620
0.0057	4.3		3580
0.0076	4.9		3540
0.0113	5.1		3500
0.0174	5.3		3460
0.0268	5.3		3420
0.0402	5.4		3380
0.0586	5.4		3340
0.0281	5.9		3300
0.1086	5.5		3260
0.1324	5.6		3220
0.1493	5.6		3180
0.1652	5.7		3140
0.1958	5.8		3100
0.2697	5.7		3060
0.4363	5.7		2980
1.2824	5.3		2940
1.7774	5.3		2900
1.9363	5.3		2860
1.7316	5.5		2820
1.4357	5.6		2780
1.2672	5.7		2740
1.2760	5.8		2700
1.4413	5.8		2660
1.6839	5.8		2620
1.9380	5.8		2580
2.0856	5.8		2540
2.1649	5.9		2500
2.2587	5.9		2460
2.4394	5.9		2420
2.6929	5.9	$(3/2^+,5/2,7/2^-)$	2403.5
2.7775	6.0	$(1/2^+$ to $5/2^+)$	2326.7
3.1681	6.2		2155.42
6.8953	6.2	(1/2,3/2)	1843.2
6.8953	6.2	(1/2,3/2)	1832.67
4.3247	8.5 1u	$(1/2,3/2)^-$	784.50
		$3/2^+$	466.37
		$3/2^-$	321.66
0.5103	8.4	$3/2^+$	272.78
		$7/2^+$	229.40
		$1/2^+$	159.526
≤9	≥7.3	$3/2^+$	0.0

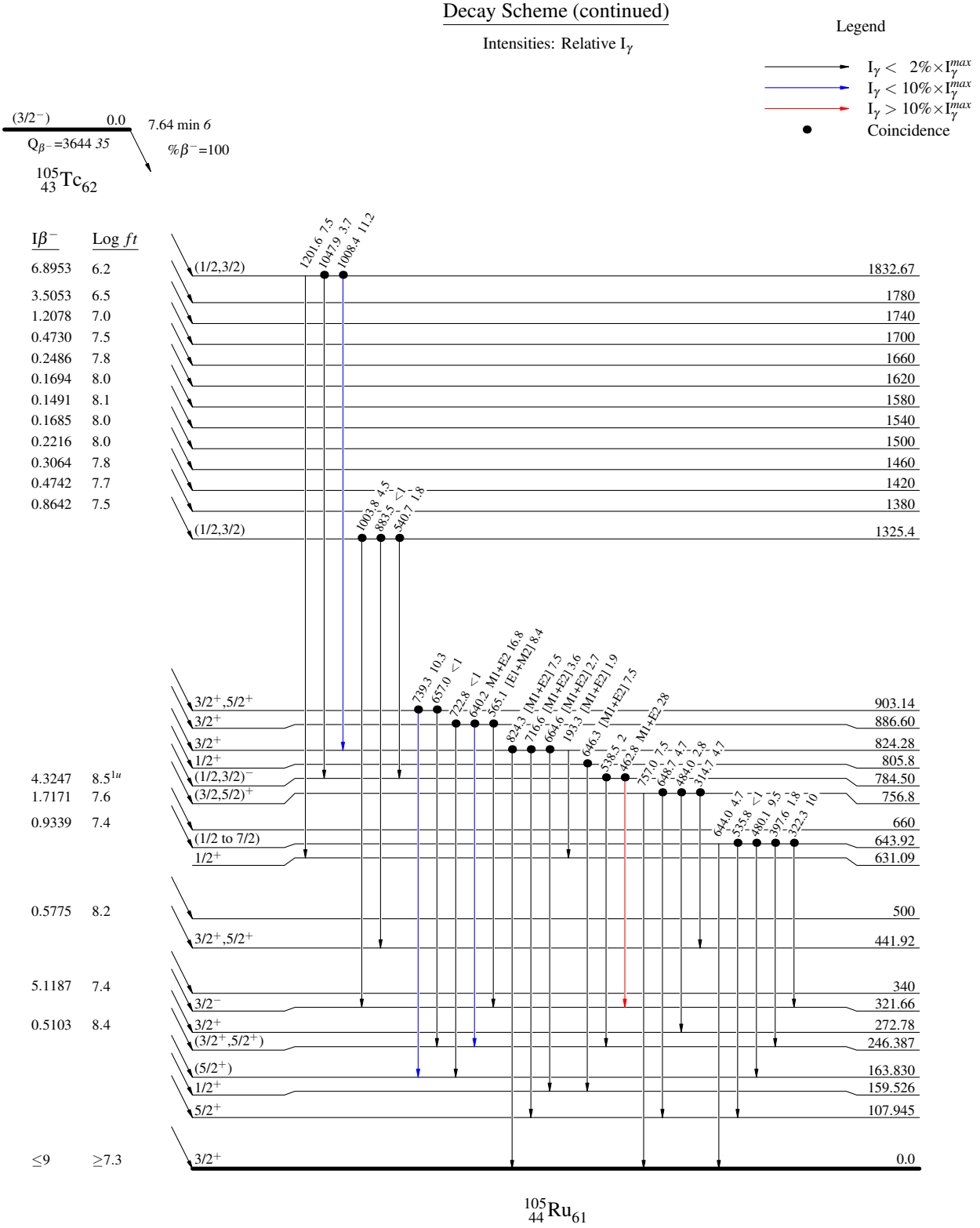
2174.0 2.8; 2082.0 9.5; 2167.2 2.0; 2053.9 9.5; 2155.4 14.0; 1882.7 1.0; 1370.8 4.5; 1683.9 <1; 1570.5 <1; 1058.5 5.6; 1673.3 <1; 1560.1 13.0; 1510.6 15.0; 1366.3 20.6

$^{105}_{44}Ru_{61}$

^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26

Decay Scheme (continued)

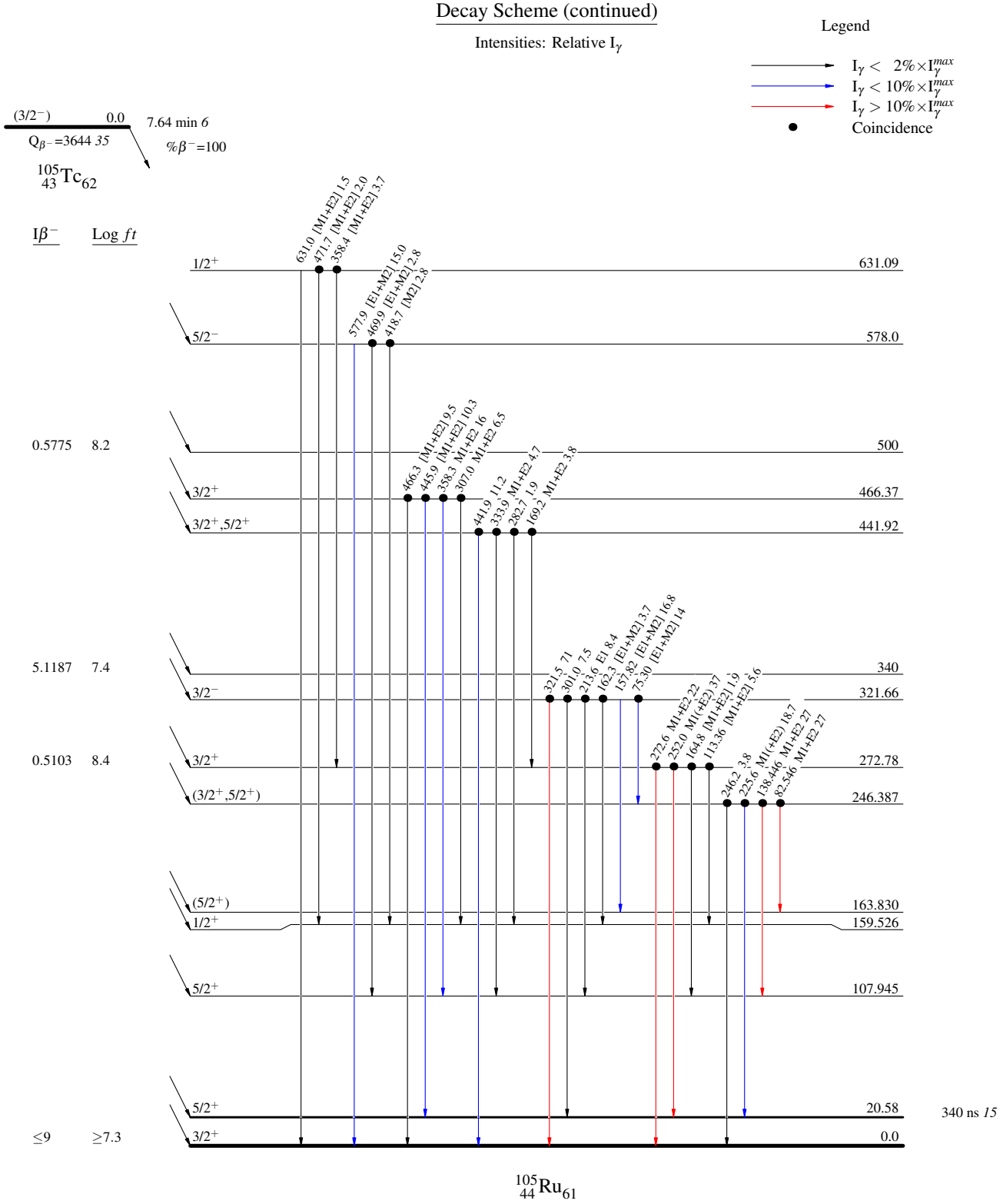
Intensities: Relative I_γ



^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26

Decay Scheme (continued)

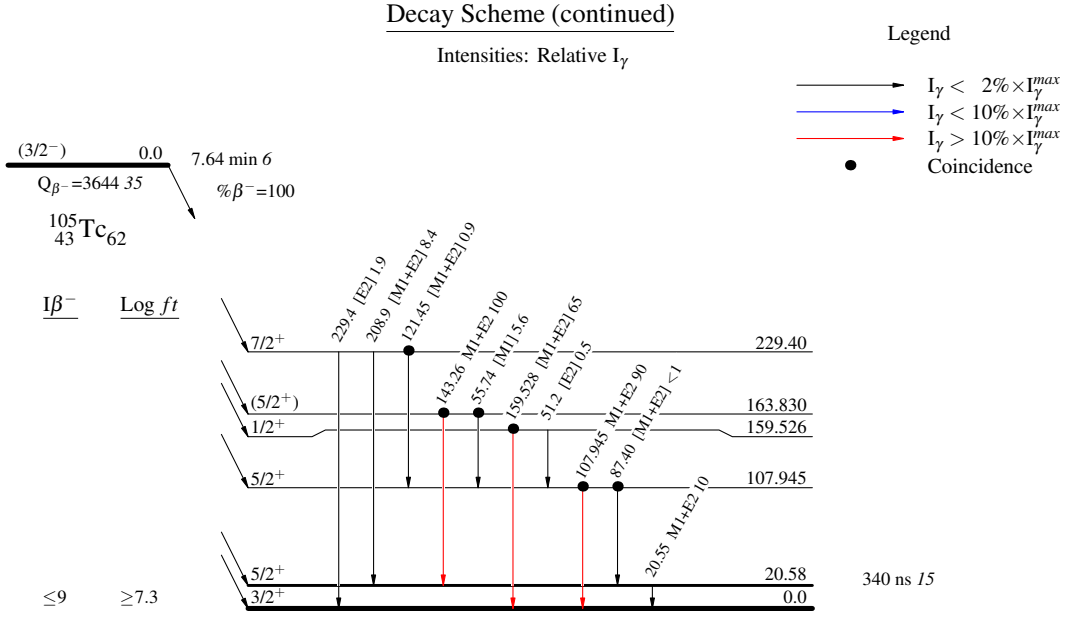
Intensities: Relative I_γ



^{105}Tc β^- decay 2013Jo02,1975Su02,1979Bo26

Decay Scheme (continued)

Intensities: Relative I_γ



$^{105}_{44}Ru_{61}$