

²⁰⁸Pb(⁴⁸Ca,Xγ), ²³⁸U(⁴⁸Ca,Xγ) 2011Sz01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 177, 509, 2021	4-Jul-2021

Reactions: ²⁰⁸Pb(⁴⁸Ca,Xγ), E=305 MeV and ²³⁸U(⁴⁸Ca,Xγ), E=330 MeV from Argonne Tandem Linear Accelerator System (ATLAS) at Argonne National Laboratory. The beam was pulsed with 800 ns separation between pulses. Targets: 50 mg/cm²-thick enriched ²⁰⁸Pb and 50 mg/cm²-thick ²³⁸U. Gamma rays observed by Gammasphere spectrometer consisting of 101 Compton-suppressed Ge detectors. Measured, Eγ, Iγ, and γ-γ(t) coincidences.

²⁰³Hg Levels

E(level) [†]	Jπ [‡]	T _{1/2}	Comments
0.0	5/2 ⁻		
591.40 20	9/2 ⁻		
932.9 3	13/2 ⁺	22.1 μs 10	%IT=100 T _{1/2} : From Adopted Levels. Configuration=ν(i _{13/2} ⁻¹).
1307.7 3	(17/2 ⁺)		
2013.1 4	(21/2 ⁺)		
2961.4 4	(23/2 ⁻)		
3079.4 4	(25/2 ⁺)		
3153.0 4	(27/2 ⁻)		
3693.2 4	(29/2 ⁻)		
3792.2 4	(31/2 ⁻)		
4587.5 4	(31/2 ⁻ ,35/2 ⁻)		
4681.7 5	(33/2 ⁻)		
4805.5 4	(33/2 ⁺)		
5174.0 5	(35/2 ⁺)		
5319.5 5	(39/2 ⁺)	7.8 ns 15	%IT=100 T _{1/2} : From 261γ+533γ+847γ+1320γ (start)-369γ+639γ+1013γ+1066γ (stop)(Δt).
5852.3 5	(43/2 ⁺)		
6699.7 5	(45/2 ⁻)		
6960.7 5	(49/2 ⁻)		
7394.0 5	(47/2 ⁻)		
7526.6 6	(47/2 ⁻)		
8281.0 5	(53/2 ⁺)	146 ns 30	%IT=100 T _{1/2} : From 2152γ (start)-261γ+533γ+847γ+1320γ (stop)(Δt). Configuration=π(h _{11/2} ⁻²)ν(i _{13/2} ⁻³).
10434.0 12			

[†] From a least-squares fit to Eγ.

[‡] From 2011Sz01.

γ(²⁰³Hg)

Eγ [†]	Iγ [†]	E _i (level)	J _i ^π	E _f	J _f ^π	Mult.	Comments
74	40 20	3153.0	(27/2 ⁻)	3079.4	(25/2 ⁺)	E1	α(exp)<2.0 (2011Sz01) Prompt intensity cannot be determined because of contaminant Pb x rays.
99		3792.2	(31/2 ⁻)	3693.2	(29/2 ⁻)		Intensity could not be determined because of contaminant U x rays.
145.5 1	35 10	5319.5	(39/2 ⁺)	5174.0	(35/2 ⁺)	E2	α(exp)=1.8 8 (2011Sz01) Iγ(prompt)=4 1.
191.6 2	29 1	3153.0	(27/2 ⁻)	2961.4	(23/2 ⁻)	E2	α(exp)=0.42 8 (2011Sz01) Iγ(prompt)=15 1.

Continued on next page (footnotes at end of table)

$^{208}\text{Pb}(^{48}\text{Ca},\text{X}\gamma), ^{238}\text{U}(^{48}\text{Ca},\text{X}\gamma)$ **2011Sz01 (continued)** $\gamma(^{203}\text{Hg})$ (continued)

E_γ †	I_γ †	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	Comments
218.5 2	11 1	4805.5	(33/2 ⁺)	4587.5	(31/2 ⁻ ,35/2 ⁻)	E1	$\alpha(\text{exp})<0.1$ (2011Sz01)
261.0 1	85 10	6960.7	(49/2 ⁻)	6699.7	(45/2 ⁻)	E2	$\alpha(\text{exp})=0.09$ 16 (2011Sz01) $I_\gamma(\text{prompt})=3$ 1.
341.5‡ 2		932.9	13/2 ⁺	591.40	9/2 ⁻	[M2]	
368.6 2	54 6	5174.0	(35/2 ⁺)	4805.5	(33/2 ⁺)	M1	$\alpha(\text{exp})=0.21$ 14 (2011Sz01) $I_\gamma(\text{prompt})=9$ 1.
374.8 1	97 7	1307.7	(17/2 ⁺)	932.9	13/2 ⁺	(E2)	$\alpha(\text{exp})=0.03$ 13 (2011Sz01) $I_\gamma(\text{prompt})=100$.
433# 1	<4	7394.0	(47/2 ⁻)	6960.7	(49/2 ⁻)		
492.2 2	27 2	5174.0	(35/2 ⁺)	4681.7	(33/2 ⁻)		$I_\gamma(\text{prompt})=4$ 1.
532.8 1	103 19	5852.3	(43/2 ⁺)	5319.5	(39/2 ⁺)		$I_\gamma(\text{prompt})=6$ 1.
540.2 1	18 6	3693.2	(29/2 ⁻)	3153.0	(27/2 ⁻)		$I_\gamma(\text{prompt})=15$ 2.
565.5 4	8 2	7526.6	(47/2 ⁻)	6960.7	(49/2 ⁻)		
591.4‡ 2		591.40	9/2 ⁻	0.0	5/2 ⁻		
639.2 1	76 5	3792.2	(31/2 ⁻)	3153.0	(27/2 ⁻)		$I_\gamma(\text{prompt})=29$ 3.
694.4 2	7 1	7394.0	(47/2 ⁻)	6699.7	(45/2 ⁻)		
705.4 1	100 10	2013.1	(21/2 ⁺)	1307.7	(17/2 ⁺)		$I_\gamma(\text{prompt})=97$.
753.9 5	8 3	8281.0	(53/2 ⁺)	7526.6	(47/2 ⁻)		
795.4 1	10 1	4587.5	(31/2 ⁻ ,35/2 ⁻)	3792.2	(31/2 ⁻)		
847.4 1	103 17	6699.7	(45/2 ⁻)	5852.3	(43/2 ⁺)		$I_\gamma(\text{prompt})=4$ 1.
887.4 4	11 4	8281.0	(53/2 ⁺)	7394.0	(47/2 ⁻)		
889.4 2	21 3	4681.7	(33/2 ⁻)	3792.2	(31/2 ⁻)		$I_\gamma(\text{prompt})=5$ 1.
948.3 1	41 2	2961.4	(23/2 ⁻)	2013.1	(21/2 ⁺)		$I_\gamma(\text{prompt})=39$ 3.
988.4 2	4 1	4681.7	(33/2 ⁻)	3693.2	(29/2 ⁻)		
1013.2 1	55 4	4805.5	(33/2 ⁺)	3792.2	(31/2 ⁻)		$I_\gamma(\text{prompt})=14$ 2.
1066.3 1	60 7	3079.4	(25/2 ⁺)	2013.1	(21/2 ⁺)		$I_\gamma(\text{prompt})=37$ 3.
1108#	<3	6960.7	(49/2 ⁻)	5852.3	(43/2 ⁺)		
1320.3 2	73 8	8281.0	(53/2 ⁺)	6960.7	(49/2 ⁻)		$I_\gamma(\text{prompt})=1$ 1.
2153 1		10434.0		8281.0	(53/2 ⁺)		E_γ : From prompt γ -ray spectra.

† From 2011Sz01. I_γ for delayed transitions (gamma rays within a 800 ns beam off period) are quoted, while values for prompt γ 's (during the ~ 0.3 ns wide beam pulses) are given in comments.

‡ From Adopted gammas.

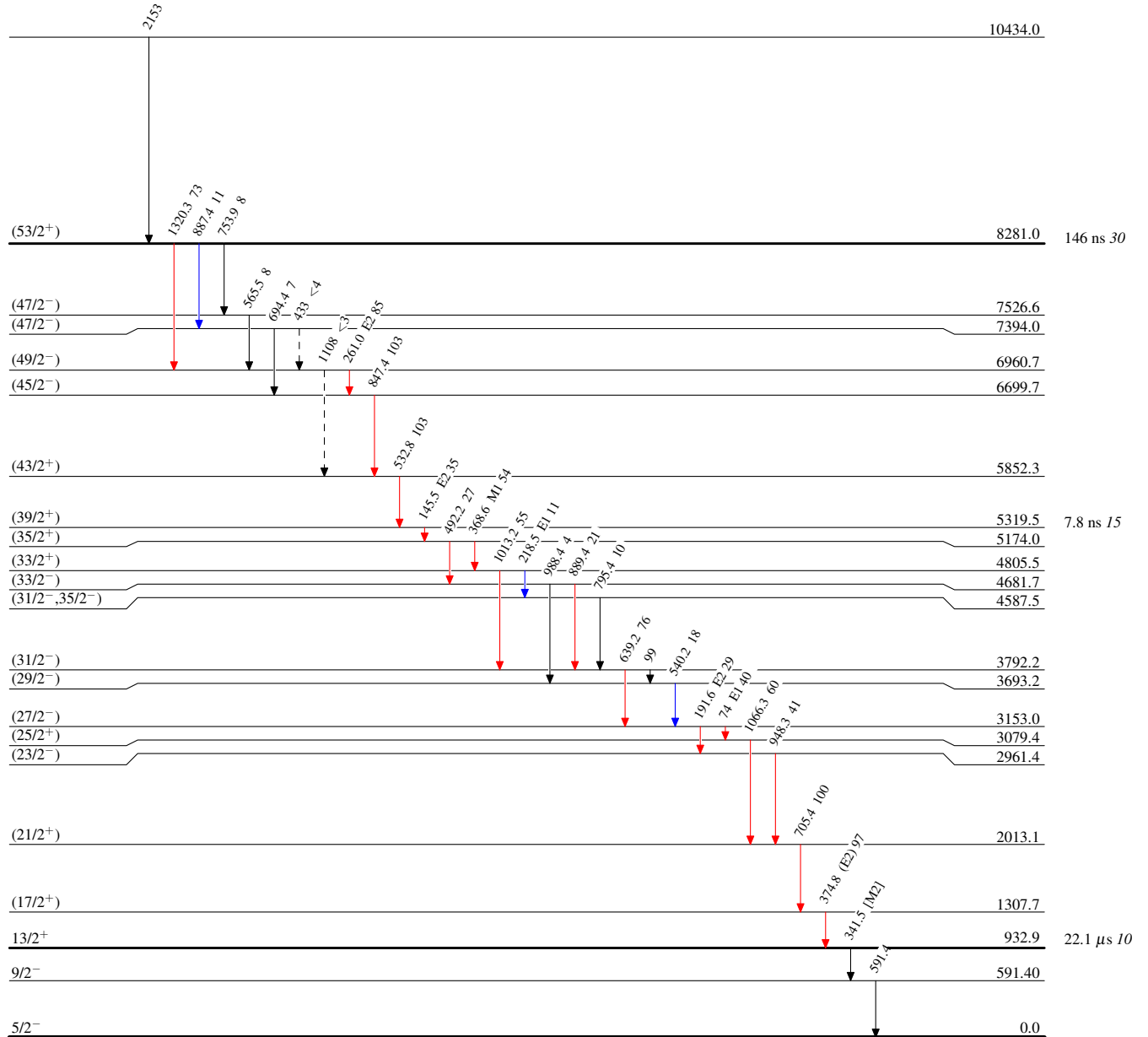
Placement of transition in the level scheme is uncertain.

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Legend

Level Scheme
 Intensities: Relative I_γ

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

 $^{203}_{80}\text{Hg}_{123}$