

$^{238}\text{U}(^{64}\text{Ni},\text{X}\gamma)$  **2007Lu13**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 196,17 (2024)	30-Sep-2023

**2007Lu13:** E=400 MeV  $^{64}\text{Ni}$  beam was provided by the LNL Tandem-ALPI accelerator. Target was  $400 \mu\text{g}/\text{cm}^2$   $^{238}\text{U}$ . Projectile-like nuclei were analyzed with the PRISMA large acceptance magnetic spectrometer.  $\gamma$  rays were detected with the CLARA array containing 25 Clover Ge detectors with Compton-suppression. Measured  $E\gamma$ ,  $I\gamma$ ,  $\gamma\gamma$ -coin. Deduced levels, J,  $\pi$ . Comparisons with large-scale shell-model calculations.

**2008HoZP:** E=430 MeV/nucleon  $^{64}\text{Ni}$  beam was produced from the ATLAS accelerator at ANL. Target was  $55 \text{mg}/\text{cm}^2$  isotopically enriched  $^{238}\text{U}$ .  $\gamma$  rays were detected with the Gammasphere array consisting of about 100 HPGe detector module with Compton-suppression. Measured  $E\gamma$ ,  $I\gamma$ ,  $\gamma\gamma$ -coin,  $\gamma\gamma\gamma$ -coincidence.

**2008HoZP** concludes that no coincidence relationship could be established for  $356\gamma$ ,  $819\gamma$  and  $1404\gamma$  seen in **2007Lu13** in any of the  $\gamma\gamma\gamma$  cubes constructed using prompt or delayed time windows, in an attempt to establish coincidence relationship between those transitions. However, that is what should be expected since  $356\gamma$  feeding the  $(5/2^-)$  g.s. is not in coincidence with  $819\gamma$  and  $1404\gamma$  feeding the  $(9/2^+)$  level with unknown excitation energy, based on the proposed level scheme in **2007Lu13**. No transition or level that belongs to  $^{63}\text{Fe}$  is reported in **2008HoZP**.

$^{63}\text{Fe}$  Levels

E(level) <sup>†</sup>	J $\pi$ <sup>‡</sup>	Comments
0.0	$5/2^-$	J $\pi$ : from Adopted Levels.
0+x <sup>#</sup>	$(9/2^+)$	<a href="#">Additional information 1.</a>
356.20 20	$(3/2^-)$	
819.0+x <sup>#</sup> 4	$(13/2^+)$	
2223.1+x <sup>#</sup> 7	$(17/2^+)$	

<sup>†</sup> From  $E\gamma$  data.

<sup>‡</sup> Proposed by **2007Lu13** based on shell-model predictions, unless otherwise noted. The two transitions of 819 and 1404 keV are proposed to depopulate the states corresponding to the coupling of the  $g_{9/2}$  neutron to the  $^{62}\text{Fe}$   $2^+$  and  $4^+$  states above a  $9/2^+$  level of unknown excitation energy; the 356 keV transition is interpreted to feed the ground state from a  $(3/2^-)$  level of  $p_{3/2}$  character (**2007Lu13**).

<sup>#</sup> Band(A): Band based on  $(9/2^+)$  (**2007Lu13**).

$\gamma(^{63}\text{Fe})$

$E_\gamma$ <sup>†</sup>	$I_\gamma$ <sup>†</sup>	$E_i(\text{level})$	J $\pi_i$	$E_f$	J $\pi_f$
356.2 2	45 9	356.20	$(3/2^-)$	0.0	$5/2^-$
819.0 4	100 15	819.0+x	$(13/2^+)$	0+x	$(9/2^+)$
1404.1 5	39 7	2223.1+x	$(17/2^+)$	819.0+x	$(13/2^+)$

<sup>†</sup> From **2007Lu13**.

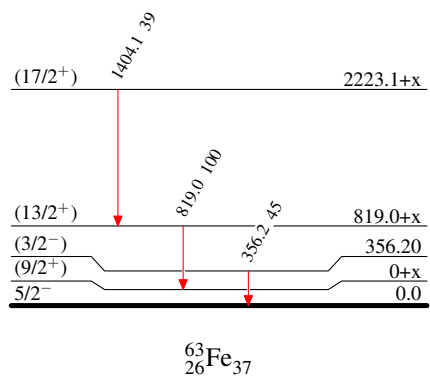
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## Level Scheme

Intensities: Relative  $I_\gamma$ 

## Legend

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



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**Band(A): Band based on**  
**(9/2<sup>+</sup>) (2007Lu13)**

(17/2<sup>+</sup>)    2223.1+x

1404

(13/2<sup>+</sup>)    819.0+x

819

(9/2<sup>+</sup>)    0+x

${}^{63}_{26}\text{Fe}_{37}$