

Abstract Submitted
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The 3_1^- level in ^{56}Fe N. FOTIADES, M. DEVLIN, R.O. NELSON, LANL, NM, USA — The question whether the 3076.2-keV, (3^-), or the 4509.6 keV, 3^- , is the first 3^- level in ^{56}Fe is important for reaction model calculations [see M. B. Chadwick *et al.*, Nucl. Data Sheets **118**, 1 (2014)]. The inclusion in the databases of the 3076.2-keV level will be discussed. A work by A. M. Demidov *et al.* [Phys. Atom. Nucl. **67**, 1884 (2004)] using the $^{56}\text{Fe}(n,n'\gamma)$ reaction and fast neutrons from a reactor, reported that the 3076.2-keV state does not exist and triggered the present work, where γ - γ coincidence data in ^{56}Fe , which are more definitive, were recorded with the GEANIE spectrometer comprised of 26 high-purity Ge detectors. The pulsed beam of the Los Alamos Neutron Science Center's WNR facility provided fast neutrons impinging on a ^{56}Fe target. As we reported in Phys. Rev. C **81**, 037304 (2010), our experiment supported the assignment of the 4509.6 keV level as the first 3^- state, with no observation in the gated spectra of the two transitions that were reported to decay out of the 3076.2-keV level by Z. Guo *et al.* [Nucl. Phys. **A540**, 117 (1992)]. A plan to repeat the (p, γ) reaction that reported the observation of these two transitions will be discussed.

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