

Abstract Submitted  
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**Determination of Decay Characteristics of  $^{54}\text{Fe}$  Excited Levels through Inelastic Neutron Scattering** R.L. PECHA, S.F. HICKS, A.J. FRENCH, S.L. HENDERSON, Z.C. SANTONIL, University of Dallas, B.K. THOMPSON, J.R. VANHOY, US Naval Academy, ERIN PETERS, TIMOTHY ROSS, S.W. YATES, University of Kentucky, UNIVERSITY OF DALLAS TEAM, US NAVAL ACADEMY TEAM, UNIVERSITY OF KENTUCKY TEAM — Due to the importance of neutrons for the successful and safe operation of fission reactors, it is necessary to obtain accurate and expansive knowledge about how they interact with the surrounding materials. Iron is commonly used to build reactor components, and how neutrons interact with Fe can affect the efficiency and rate of reaction within a reactor. This research studies the gamma ray emission and neutron scattering probabilities from two common iron isotopes,  $^{54}\text{Fe}$  and  $^{56}\text{Fe}$ , when bombarded with a monoenergetic neutron beam in the 1.5 MeV-4.7 MeV range. This talk will focus on the gamma ray emissions from an enriched  $^{54}\text{Fe}$  sample that has been excited by inelastic scattering of neutrons. From these emissions, a nuclear excitation level scheme was built, and new information about the excitation of  $^{54}\text{Fe}$  nuclei was obtained. A basic overview of the experimental equipment used, measurements taken, results, and final level scheme will be discussed and compared to previous measurements.

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