

Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Comparison gamma spectrum between RIANIER and ENSDF for ^{55}Mn and other nuclei JOSSELYN VELASQUEZ, City College of New York - CUNY, DAVID BROWN, GUSTAVO NOBRE, Brookhaven National Laboratory — Neutron capture occurs when a neutron is absorbed by a target nucleus, the resulting nucleus is left in a highly excited state at or above the neutron separation energy. This compound nucleus decay by the emission of a high energy primary gamma-ray, followed by a secondary gamma cascade of much lower energy gamma rays. Each isotope emits a unique gamma-ray spectrum, providing a fingerprint that we can use to unambiguously identify the isotopic composition of a sample. This is the basis for Prompt Gamma Activation Analysis (PGAA), a non-destructive elemental analysis, commonly used in oil well logging that will be adopted by NASA for the Dragonfly mission to Titan. At the annual Cross Section Evaluation Working Group meeting, and again at the WANDA2020 workshop, it was noted that there are serious deficiencies in evaluated capture gamma spectra caused by poor ENDF/B-VIII.0 data. Beginning with ^{55}Mn , a gamma-ray decay simulator code RAINIER was used, and the results are compared to CapGam, ENSDF, and ENDF with the aim of developing an approach for evaluating capture gamma spectra.

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Date submitted: 13 Jul 2020

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