Contribution ID: **15** Type: **not specified**

Constraining capture rates on radionuclides through neutron transmission with the DICER instrument at LANSCE

Tuesday 26 August 2025 09:00 (45 minutes)

With very few exceptions, direct measurements of neutron capture rates on radionuclides have not been possible. A number of indirect methods have been pursued, however, substantial effort has been devoted to quantify the usually large systematic errors that accompany the results from these techniques. A new instrument has been developed at the Los Alamos Neutron Science CEnter (LANSCE) to provide more accurate data on several radionuclides relevant to nuclear criticality safety, radiochemical diagnostics, astrophysics, nuclear forensics and nuclear security, by measuring the transmission of neutrons through radioactive samples and studying resonance properties. The Device for Indirect Capture on Radionuclides (DICER) and associated radionuclide production at the Isotope Production Facility (IPF), both at LANSCE, as well radioactive sample fabrication, have been under development the last few years. A description of the apparatus and two cases studies on 88Zr and 88Y will be presented.

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Session Classification: Tuesday I