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## Constraining the $^{69}\text{Zn}$ Neutron Capture Cross-Section via the Beta-Oslo Method

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The existence of the weak intermediate neutron-capture process (i-process) explains the observed astrophysical abundances of elements around the  $Z < 50$  region. Neutron capture reactions in the  $A = 70$  mass region for Ni, Cu, and Zn isotopes are known to produce large variations in predicted i-process abundances. Predicted stellar abundances of Ga are particularly affected by the  $^{69}\text{Zn}(n, \gamma)^{70}\text{Zn}$  reaction. The  $\beta$ -decay of  $^{70}\text{Cu}$  offers an unique opportunity to utilize the  $\beta$ -Oslo method to experimentally determine the  $\gamma$ -ray strength function and nuclear level density and constrain the  $^{69}\text{Zn}(n, \gamma)^{70}\text{Zn}$  reaction rate for i-process nucleosynthesis.  $^{70}\text{Cu}$  has three different  $\beta$ -decaying spin-parity states that populate different spin ranges at similar excitation energies in the daughter nucleus: the  $6^-$  ground state, the 101 keV  $3^-$  isomeric state, and the 242 keV  $1^+$  isomeric state. In experiments performed at the NSCL and FRIB, the isomers and ground state of  $^{70}\text{Cu}$  were produced and delivered to the Low Energy Beam and Ion Trap (LEBIT) and then to Summing NaI (SuN) Total Absorption Spectrometer. Preliminary results from  $\beta$ -Oslo analysis will be presented along with the preliminary constrained  $^{69}\text{Zn}(n, \gamma)^{70}\text{Zn}$  cross-section. Initial results from the commissioning of the SuN upgrade (to SuN++) will also be presented.

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