

$^{80}\text{Ge}(d,p\gamma)$ measurements at FRIB to inform (n,γ) reaction rates in weak r-process nucleosynthesis

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Individual (n,γ) rates become important in the weak r-process near $Z=26-34$ and $N=50$ during freeze out from a hot process. The (n,γ) rates for a handful of specific isotopes exhibit notable impacts on final r-process abundance patterns in sensitivity studies [1]. One such nucleus with enhanced sensitivity is ^{80}Ge and is in reach for reaction studies at FRIB. The $^{80}\text{Ge}(d,p\gamma)$ reaction will be measured at FRIB in April 2024 using GODDESS (GRETINA ORRUBA: Dual Detectors for Experimental Structure Studies) [2] and the S800 at ~ 45 MeV/u. This measurement aims to constrain spectroscopic factors for bound states including low-lying $1/2^+ - 5/2^+$ doublet. This will be done in combination with a previous measurement at ~ 4 MeV/u [3], from which direct neutron capture cross sections will be determined. Additionally, the experiment will inform the compound nucleus (n,γ) cross sections via the Surrogate Reaction Method [4]. Experimental set up and preliminary data from the experiment will be discussed.

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