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Constraining the rp-process by measuring ^{23}Al(d,n)^{24}Si with GRETINA and LENDA at NSCL

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The ^{23}Al(p,γ)^{24}Si stellar reaction rate has a significant impact of the light-curve emitted in X-ray bursts. Theoretical calculation shows that the reaction rate is mainly determined by the properties of direct capture as well as low-lying 2^+ states and a possible 4^+ state in ^{24}Si. Currently, there is little experimental information on the properties of these states. We present a new experimental study, using surrogate reaction ^{23}Al(d,n) at 47 AMeV at the National Superconducting Cyclotron Laboratory (NSCL),USA.
We detect the full kinematics of the reaction, using the Gamma-Ray Energy Tracking In-beam Nuclear Array (GRETINA) to detect the γ-rays following the de-excitation of the reaction products, the Low Energy Neutron Detector Array (LENDA) to detect the recoiling neutrons and the S800 for identification of the ^{24}Si recoils. These information will be used to determine the highly needed properties of the ^{24}Si. \\
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