Abstract Submitted
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Studying ^{20}Ne(α,p)^{23}Na directly with HELIOS[1] JIANPING LAI, DANIEL SANTIAGO-GONZALEZ, CATHERINE DEIBEL, AMBER LAUER, LIUDMYLA AFANASIEVA, JEFFREY BLACKMON, Louisiana State Univ - Baton Rouge, SERGIO ALMARAZ, Florida State University, CALEM HOFFMAN, BENJAMIN KAY, BIRGER BACK, Argonne National Laboratory, HELIOS COLLABORATION — During nucleosynthesis (α,p) reactions are important in a variety of astrophysical sites, including classical novae, X-ray bursts and supernovae. Direct measurements of these reaction rates are needed to reduce uncertainties and understand the nucleosynthesis in these stellar sites. Sensitivity studies indicate that the ^{20}Ne(α,p)^{23}Na reaction contributes significantly to the energy output and nucleosynthesis abundances produced in Type Ia supernovae. Recently we performed a direct experimental study of the ^{20}Ne(α,p)^{23}Na reaction with the HELIcal Orbit Spectrometer (HELIOS) at Argonne National Laboratory. A cryogenic gas target was implemented to produce a high-density ^{4}He gas target and the heavy recoils were detected with a high counting rate gas ionization chamber in coincidence with the protons, which were detected in the HELIOS Si array. The reaction was measured through inverse kinematics with ^{20}Ne beams at multiple energies. Promising results have been achieved. This experiment also serves as a stable beam proof-of-principle study for future direct measurements of other (α,p) reactions using radioactive beam. Preliminary analysis will be presented.

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