

Abstract Submitted
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Direct studies of (α,p) reactions with HELIOS¹ JIANPING LAI, J.C. BLACKMON, C.M. DEIBEL, D. DIMARCO, H. GARDINER, A. LAUER, D. SANTIAGO-GONZALEZ, C. WILLIAMS, Louisiana State University at Baton Rouge, B. DIGIOVINE, J. GREENE, J. ROHRER, Argonne National Laboratory, HELIOS GROUP AT ARGONNE NATIONAL LAB COLLABORATION — In a variety of astrophysical processes, (α,p) type reactions have significant effects on final energy output and elemental abundances. However, only a handful of reactions have been measured due to technical limitations. Innovative new equipment and techniques, therefore, are necessary to extend measurement limits of these reactions rates. The HELical Orbit Spectrometer(HELIOS), serves as an important tool in studying reactions using radioactive ion beams at the Argonne Tandem Linac Accelerator System facility. With a specially designed gas target, we are able to study (α,p) reaction directly. HELIOS can separate protons from reactions with different energy states and the heavy recoils can be detected in coincidence by a high efficiency gas ionization detector. This combination has been successful in our pilot experiments. A series of (α,p) experiments using this setup in HELIOS are planned. We will start with $^{20}\text{Ne}(\alpha,p)$, which is crucial in Type Ia supernovae. A direct measurement of $^{30}\text{S}(\alpha,p)$, a key reaction in X ray burst, is also included in the near future plans and the beam development of ^{30}S is in progress. Preliminary results will be presented.

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