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Developing the (d,pγ) reaction as a surrogate for (n,γ) in inverse kinematics[1] ALEXANDR LEPAILLEUR, HARRY SIMS, HEATHER GARLAND, TRAVIS BAUGHER, JOLIE A CIZEWSKI, ANDREW RATKIEWICZ, DAIVID WALTER, Rutgers University, STEVEN D PAIN, Oak Ridge National Laboratory, KARL SMITH, University of Tennessee, GODDESS COLLABORATION COLLABORATION — The r-process that proceeds via (n,γ) reactions on neutron-rich nuclei is responsible for the synthesis of about half of the elements heavier than iron. Because (n,γ) measurements on short-lived isotopes are not possible, the (d,pγ) reaction is being investigated as a surrogate for (n,γ). The experimental setup GODDESS (Gammasphere ORRUBA: Dual Detectors for Experimental Structure Studies) has been developed especially for this purpose. The Oak Ridge Rutgers University Barrel Array (ORRUBA) of position-sensitive silicon strip detectors was augmented with annular arrays of segmented strip detectors at backward and forward angles, resulting in a high-angular coverage for light ejectiles (20 to 160 degrees in the laboratory frame). The ^{134}Xe(d,pγ) reaction, used to commission the setup, was measured in inverse kinematics with stable beams from ATLAS impinged on C_2D_4 targets. Reaction protons were measured (ORRUBA) in coincidence with gamma rays (Gammasphere). An overview of GODDESS and preliminary results from the ^{134}Xe(d,pγ) study will be presented.

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