The first measurements using GODDESS

S. D. PAIN, Oak Ridge National Laboratory, A. RATKIEWICZ, T. BAUGHER, Rutgers University, M. FEBBRARO, Oak Ridge National Laboratory, J. A. CIZEWSKI, Rutgers University, GODDESS COLLABORATION — Direct reaction measurements, such as transfer, inelastic scattering, and charge-exchange reactions, are well-established probes of nuclear structure. Measurements are often made in inverse-kinematics, a technique applicable to both stable and radioactive beams, using large-area charged-particle detectors. There are trade-offs between optimizing for charged-particle or gamma-ray detection - especially gamma-ray efficiency and charged-particle angular resolution. GODDESS (Gammasphere ORRUBA: Dual Detectors for Experimental Structure Studies) is a coupling of a ~ 700-channel highly-segmented silicon detector array (based on ORRUBA) with the Gammasphere HPGe array. Gammasphere, has an unusually large internal geometry (14” cavity), allowing a full implementation of a large well-optimized charged-particle array. GODDESS provides charged-particle detection with ~ 1° resolution in polar angle, between 15° and 165° (~ 80% azimuthal coverage), with a few tens of keV energy resolution. A compact fast ionization chamber is incorporated for measurement of beam-like species at zero degrees. The first campaign of in-beam measurements with GODDESS was conducted July-September 2015. Details of GODDESS and the commissioning experiment will be presented.

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