Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

**Implementation of Gammasphere – ORRUBA: Dual Detectors for Experimental Structure Studies (GODDESS)**[1] IAN MARSH, STEVEN PAIN, Physics Division, Oak Ridge National Lab, ANDREW RATKIEWICZ, SEAN BURCHER, Rutgers University, GODDESS COLLABORATION — Direct reactions involving short-lived nuclei are of great interest to nuclear science. Typically, the light ejectile emitted in the reaction is measured but de-excitation gamma rays from the recoiling nucleus can yield extra information on the states populated and the levels through which they decay. These gamma rays can be measured with significantly better energy resolution than the charged particles. To achieve these measurements, the Oak Ridge Rutgers University Barrel Array of silicon detectors (ORRUBA) is being coupled with Gammasphere, a high-granularity spherical array of Compton-suppressed HPGe detectors. For this coupling the coverage of ORRUBA is extended with custom end-cap detectors, providing a total of 80% azimuthal coverage over 15 – 165 degrees in polar angle. GODDESS hardware (detector mounts, vacuum chamber, preamplifiers) has been developed, installed, and tested at Argonne National Lab, in preparation for radioactive beam experiments. Data from a $^{249}$Cf source was collected via digital and analog acquisition systems. Preliminary analysis shows energy and position resolutions of 30 keV and <1mm for alpha-particles were achieved. Optimization of digital techniques for the readout of position-sensitive silicon detectors is under development.

[1]Work funded by the DOE Office of Science

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Date submitted: 25 Jul 2013 Electronic form version 1.4