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Measuring the Nuclear Levels in ^{19}Ne using GODDESS MATTHEW HALL, University of Notre Dame, THE EXPERIMENT 1488 COLLABORATION COLLABORATION — A direct way to test nova explosion models is to observe gamma rays created in the decay of radioactive isotopes produced in the nova. One such isotope, ^{18}F, is believed to be the main source of observable 511-keV gamma rays. The main destruction mechanism of ^{18}F is thought to be the ^{18}F(p,α)^{15}O reaction, and the uncertainty in the reaction rate is attributed to uncertainties in the energies, spins, and parities of the nuclear levels in ^{19}Ne above the proton threshold. A ^{3}He beam was used at Argonne National Lab in an effort to understand the levels in ^{19}Ne via the ^{19}F(^{3}He,t)^{19}Ne reaction. Gammasphere ORRUBA Dual Detectors for Experimental Structure Studies (GODDESS) was used to measure gamma rays from the decay of ^{19}Ne in coincidence with the reaction tritons. Preliminary data from the experiment will be presented. This research was supported by the National Science Foundation, the US DOE Office of Nuclear Physics and the National Nuclear Security Administration.

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