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Tagging the Decay of Neutron Unbound States near the Dripline[1]

ALISSA WERSAL, NSCL/University of Montana, GREG CHRISTIAN, MICHAEL THOENNESSEN, ARTEMIS SPYROU, NSCL/MSU, MONA AND CAESAR COLLABORATION — Near the neutron dripline the study of neutron-unbound states is a valuable spectroscopic tool. Neutron-decay spectroscopy experiments, however, only determine the relative energy of the resonances. If the neutron decays to a bound excited state, it is necessary to measure the γ-decay in order to determine the absolute excitation energy of the initial state. The CAESium iodide ARray (CAESAR) was used for the first time in coincidence with the MoNA/Sweeper setup at the NSCL to perform this type of experiment. A secondary 70 MeV/u ^{32}Mg beam produced at the Coupled Cyclotron Facility bombarded a 288 mg/cm^2 beryllium target. After the reaction, any charged particles were deflected by a superconducting 4T large-gap dipole magnet, and their positions, time of flight, and energy loss were measured. Neutrons were detected in coincidence with the Modular Neutron Array (MoNA) while CAESAR recorded any possible gamma rays. The Doppler shifted calibration of CAESAR was performed with gamma rays from Coulomb excited ^{32}Mg and from ^{30}Na fragments. Preliminary results will be presented.

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