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Observation of a Low-Lying Neutron Unbound State in 25F

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OBSERVATION OF A LOW-LYING NEUTRON UNBOUND STATE IN 25F

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A neutron unbound state from ^{25}F has been observed for the first time. Prior experimental data on neutron-rich fluorine isotopes indicate differences for bound excited states as compared to nuclear shell model predictions. The ^{25}F isotopes were produced by one-proton removal from an 86 MeV/u 26Ne beam on a Beryllium target at the fast-fragmentation radioactive beam facility of the National Superconducting Cyclotron Laboratory at Michigan State University. The subsequent decay of the ^{25}F isotopes resulted in ^{24}F and neutrons which were detected in coincidence. The charged particles were bent away from the neutrons with a superconducting magnet and analyzed in a suite of charged particle detectors. The neutrons were detected in the Modular Neutron Array (MoNA). The properties of the charged particles and neutrons were used to reconstruct a decay energy spectrum for ^{25}F which was compared to simulations. Preliminary results indicating a resonant state at approximately 30 keV will be discussed.

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