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Determining the Energy Gap Between the sd-pf Neutron Shells in ^{25}O MICHAEL JONES, MSU/NSCL, NATHAN FRANK, Augustana College, PAUL DEYOUNG, Hope College, THOMAS BAUMANN, ZACH KOHLEY, JENNA SMITH, ARTEMIS SPYROU, KRYSTIN STIEFEL, ANTHONY KUCHERA, MICHAEL THOENNESSEN, MSU/NSCL, MONA COLLABORATION — The excited states of ^{25}O, particularly those of negative parity, are of great interest for determining the evolution of the *sd-pf* shell gap in and around the "island of inversion." Shell Model (WBBS) calculations tuned to nearby ^{27}Ne predict the $3/2^-$ state in ^{25}O to be only 500 keV above the ground state, implying the *sd-pf* shell gap to be small. Hence it is likely for nuclei beyond N=16 to have mixing between the $0d_{3/2}$ and $1p_{3/2}$ orbitals. A recent experiment, performed at the NSCL, populated ^{25}O through use of a (d,p) reaction. Using the Ursinus College Liquid Hydrogen Target, an ^{24}O beam impinged on a deuterium target cell with a thickness of 400 mg/cm^2 at a rate of approximately 30 pps to produce ^{25}O, which decayed immediately by neutron emission. The resulting charged fragments were bent by the Sweeper magnet into a suite of charged particle detectors, while the neutrons traveled unimpeded towards MoNA (Modular Neutron Array) and LISA (Large multi-Institutional Scintillator Array). Together, MoNA-LISA and the Sweeper provide a full kinematic measurement from which the decay energy of the 2-body system can be determined. Preliminary results will be discussed.

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