Abstract Submitted
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**Determining the resonance strength of the $^{56}$Ni *rp*-process waiting point through (d,n) with VANDLE and MoNA-LISA**[1] W. PETERS, ORNL & University of Tennessee, R. GRZYWACZ, M. MADURGA, S.V. PAULAUSKAS, S. TAYLOR, J. ALLEN, UTK, J.A. CIZEWSKI, B. MANNING, M.E. HOWARD, Rutgers, J. SMITH, M. JONES, T. BAUMANN, M. THOENNESSEN, MSU/NSCL, D.W. BARDAYAN, Notre Dame & ORNL, S.D. PAIN, ORNL, R.C.C. CLEMENT, US Air Force, J. BROWN, Wabash, B. LUTHER, Concordia, S. ILYUSHKIN, P.D. O'MALLEY, Col. Sch. of Mines, R. IKEYAMA, Wisconsin LaCrosse, R.L. KOZUB, Z.J. BERGSTROM, TTU, P.A. DEYOUNG, Hope, W. ROGERS, Westmont, VANDLE COLLABORATION, MONA COLLABORATION — The rapid proton capture (*rp*) process of explosive nucleosynthesis is believed to be the driver of *X*-ray bursts and creates nuclei up to around mass 110. Whereas much of this process burns in an equilibrium determined by half-lives and masses, the waiting point at $^{56}$Ni is unique. At this point the process reaches its peak luminosity and the synthesis of almost all heavier nuclei pass through the $^{56}$Ni(p,$\gamma$)$^{57}$Cu reaction. Since the gamma-decay width dominates the relevant resonance in $^{57}$Cu, a measurement of its proton partial width can be used to extract the proton-capture resonance strength. An experiment to do this was performed at the NSCL using the Versatile Array of Neutron Detectors at Low Energy (VANDLE) along with the MoNA-LISA neutron detector arrays; and was the commissioning experiment for VANDLE with a transfer reaction. The events in the digitizing electronics of VANDLE were event-matched to the MoNA-LISA-Sweeper data acquisition system.

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