Abstract Submitted
for the HAW09 Meeting of
The American Physical Society

Astrophysical measurements with radioactive $^{17}F$ beams at HRIBF

P D.W. BARDAYAN, C.D. NESARAJA, S.D. PAIN, M.S. SMITH, ORNL, K.A. CHIPPS, U. GREIFE, Col. School Mines, J.C. BLACKMON, LSU, K.Y. CHAE, B.H. MOAZEN, S.T. PITTMAN, U. Tenn., R. HATARIK, W.A. PETERS, Rutgers, R.L. KOZUB, J.F. SHRINER, JR., Tenn. Tech., C. MATEI, ORAU — The astrophysical rates of the $^{14}O(\alpha,p)^{17}F$ and $^{17}F(p,\gamma)^{18}Ne$ reactions affect the transition to the $\alpha p$-process in x-ray bursts and $^{18}F$ production in novae, respectively. Both reactions have been studied in the laboratory with the intense radioactive $^{17}F$ beams delivered at HRIBF. Recently beam intensities greater than $10^7$ $^{17}F$ ions/s have become available, making possible the first direct measurement of the $^{17}F(p,\gamma)^{18}Ne$ cross section [K. A. Chipps et al., Phys. Rev. Lett. 102, 152502 (2009)]. These high beam intensities also provide an opportunity to make the first precise determination of the resonance strength of the $1^−$ $^{14}O(\alpha,p)^{17}F$ resonance near $E_{c.m.}=1$ MeV. Recent results and upcoming plans for measurements with $^{17}F$ beams at the HRIBF will be presented.

$^1$ORNL is managed by UT-Battelle, LLC, for the U.S. DOE under contract DE-AC05-00OR22725.