Abstract Submitted
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^{18}F(a,p)^{21}Ne reaction study for astrophysical implications HYE YOUNG LEE, M. COUDER, University of Notre Dame, A. COUTURE, Los Alamos National Laboratory, J. GOERRES, E. STECH, E. STRANDBERG, W. TAN, M. WIESCHER, University of Notre Dame, H.-W. BECKER, Ruhr-Universitat Bochum, Germany, C. ANGULO, E. CASAREJOS, P. LELEUX, Universite Catholique de Louvain, Belgium, D. GROOMBRIDGE, B. FULTON, A. LAIRD, University of York, UK, M. ALIOTTA, University of Edinburgh, UK — As an alternative neutron source for the weak r-process, one of models suggested the r-process nucleosynthesis in the supernova shock passing through the He-rich shell of the pre-supernova star. In this helium rich environment, a possible neutron source for the second r-process would be the reaction sequence ^{14}N(α,γ)^{18}F(α,p)^{21}Ne(α,n)^{24}Mg with rapid depletion of ^{14}N. The (α,p) reaction on ^{18}F will be faster than β^+ decay at the high densities and temperature in the shock. The ^{18}F(α,p)^{21}Ne reaction and the inverse reaction ^{21}Ne(p,α)^{18}F have been measured in the energy range of the Gamow window. Experimental results will be presented and compared with Hauser-Feshbach calculations and the interests in nuclear physics. The astrophysical implications of the new reaction rates will be discussed.

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