Abstract Submitted
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A New Measurement of the Total Cross Section for the Photodisintegration of ^{9}Be Near Threshold[1] C.W. ARNOLD, T.B. CLEGG, H.J. KARWOWSKI, G.C. RICH, J.R. TOMPKINS, UNC Chapel Hill, TUNL, C.R. HOWELL, Duke University, TUNL — The hot and neutron rich dense matter in Type II supernovae is a plausible environment where r-process nuclei are synthesized. The $\alpha(\alpha n,\gamma)^9Be(\alpha,n)^{12}C$ sequence is the favored reaction chain for synthesizing carbon in this explosive environment. Nucleosynthesis network models indicate that the ratio of neutrons to seed nuclei at the onset of the r-process is highly sensitive to the rate of the $\alpha(\alpha n,\gamma)^9Be(\alpha,n)^{12}C$ chain relative to the $\alpha(\alpha\alpha,\gamma)^{12}C$ reaction. The rate of the $\alpha(\alpha n,\gamma)^9Be$ reaction is derived from the measured cross section for photodisintegration of ^9Be. New cross section measurements for this reaction have been made from threshold to 5 MeV using the High Intensity Gamma-ray Source (HIγS) at TUNL. The low energy spread (as low as 1%) of the beam at HIγS enabled high precision measurements at the reaction threshold energy and of the narrow resonance at 2.43 MeV. Experimental techniques and results will be presented and astrophysical consequences will be discussed.

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