Abstract Submitted
for the SES08 Meeting of
The American Physical Society

Measurement of the Total Cross-Section for the ^{9}Be(γ,nα)α reaction[1] C.W. ARNOLD, T.B. CLEGG, H.J. KARWOWSKI, UNC-Chapel Hill, TUNL, C.R. HOWELL, A.P. TONCHEV, G. RUSEV, Duke University, TUNL — The ^{9}Be(γ,nα)α cross section is key to understanding isotopic abundances of nuclei produced during the r-process. The inverse reaction bridges the unstable mass gaps at A=5 and 8 leading to α(αn,γ)^{9}Be(α,n)^{12}C and so on, producing seed nuclei for the r-process and setting the neutron-to-seed nucleus ratio that drives universal isotopic abundance predictions [Ref 1,2]. In order to make high precision measurements ($\pm$ 5%) of the ^{9}Be(γ,nα)α cross-section which includes narrow resonances, tunable gamma ray beam with small ΔE/E is required along with gamma and neutron detectors whose efficiencies are well known. We used TUNL's high intensity gamma ray source (HIγS) to measure the cross sections for ^{9}Be(γ,n) in the energy range of 1.55 to 5.0 MeV with beam energy resolutions between 14 and 150 keV as determined by large Ge detector. The neutrons were detected using ^{3}He proportional counter. Experimental details will be discussed and the results as well as their astrophysical consequences will be presented. [Ref 1] B. Meyer *et al.*, Astro J., **399** 656-664 (1992). [Ref 2] T. Kajino *et al.*, Nuc. Phys. A, **704**, 165c-178c (2002)

[1]Work Supported by the U.S. DOE, Office of Nuclear Physics, Grants DE-FG02-97ER41041 and DE-FG02-03ER41231.

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Date submitted: 18 Aug 2008 Electronic form version 1.4