Abstract Submitted
for the DNP11 Meeting of
The American Physical Society

^{26}Al Beam Production and its Application to Nuclear Astrophysics B. RICHARD, Cyclotron Institute, Texas A&M University (REU student from Arkansas Tech University), R. TRIBBLE, L. TRACHE, G. PIZZONE, B. ROEDER, Cyclotron Institute, Texas A&M University — Presumably produced during the supernova stage of stellar evolution, ^{26}Al offers unique opportunities to better understand the processes of nucleosynthesis occurring in pre-SN phases of stellar evolution and within the Galactic disk. When decaying to ^{26}Mg, ^{26}Al emits a unique 1.8MeV gamma ray, detectable by satellite telescopes. Understanding the production and destruction pathways of ^{26}Al is a key portion of understanding the on-going stellar nucleosynthesis. In order to measure the cross-section of ^{26}Al(n, p)^{26}Mg at the astrophysical relevant energies, an indirect method, called the Trojan Horse Method(THM), is utilized. The THM allows the study of neutron induced reactions at astrophysical energies via the d break-up. This method requires the three-body cross section for the ^{26}Al(d, p ^{26}Mg)H reaction to be measured at a beam of 60 MeV. The ^{26}Al secondary beam is produced by MARS at Cyclotron Institute of Texas A&M University from a primary ^{26}Mg beam (E≈16MeV/u) impinging on a H_2target, and was then degraded to 2.25MeV/u energy by means of a Be foil. The results will be shown and discussed in detail together with the features of the obtained intense and pure beam of ^{26}Al (0.5cm x 0.5cm beamspot, >97% pure, 10^6 pps). This later will be used for many applications in nuclear astrophysics using both direct and indirect methods.

Brad Richard
Cyclotron Institute, Texas A&M University

Date submitted: 03 Aug 2011 Electronic form version 1.4