Abstract Submitted
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Very low energy protons from β-delayed p-decay of proton-rich nuclei for nuclear astrophysics[1] E. SIMMONS, L. TRACHE, A. BANU, J.C. HARDY, V.E. IACOB, M. MCCLESKEY, B. ROEDER, A. SPIRIDON, R.E. TRIBBLE, Texas A&M University, T. DAVINSON, G. LOTAY, P.J. WOODS, University of Edinburgh, UK, A. SAASTAMOINEN, J. AYSTO, University of Jyvaskyla, Finland — We developed a technique to measure very low energy protons from the beta-delayed proton-decay of proton-rich nuclei produced and separated with the MARS recoil separator at TAMU. A simple setup consisting of a telescope made of a thin double sided Si strip detector (p-detector) backed or sandwiched between two thick Si detectors (β-detectors) was designed. The source nuclei are slowed down from 30-40 MeV/u and implanted in the middle of the thin p-detector. The excited states populated in daughter nucleus above the proton threshold are resonances in the radiative proton capture leading to that nucleus; therefore, beta-decay can be a useful mechanism to study these resonances. In particular, we have studied ^{23}Al and ^{31}Cl and got information on the resonances of ^{22}Na(p,γ)^{23}Mg and ^{30}P(p,γ)^{31}S reactions, both important in novae. We studied different W1 and BB2 p-detectors, 45-140 μm thick, made by MSL, and found that thinner detectors with a small cell size are best to measure proton energies as low as 2-300 keV.

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