Abstract Submitted
for the DNP08 Meeting of
The American Physical Society

Determining the (n,γ) cross section of ^{153}Gd using surrogate reactions NICHOLAS SCIELZO, Lawrence Livermore National Laboratory, STARS/LIBERACE COLLABORATION — The astrophysical s-process creates isotopes through a series of low-energy (n,γ) reactions and beta decays. Direct measurements of the (n,γ) cross sections for unstable nuclei are extremely challenging due to the challenges presented by radioactive targets and low intensity neutron beams. The surrogate reaction technique can be used to circumvent these difficulties by creating the same compound nucleus through light-ion reactions on a stable target. We have collected data to determine the low-energy (n,γ) cross section for the unstable nucleus ^{153}Gd by bombarding a stable ^{154}Gd target with protons to create the desired ^{154}Gd* compound nucleus. The STARS/LiBerACE silicon and clover germanium detector arrays were used to detect γ-rays in coincidence with the scattered protons. Additional cross section measurements using ^{156}Gd and ^{158}Gd targets are compared to direct measurements of the (n,γ) cross sections for ^{155}Gd and ^{157}Gd to check the technique. The current status of the analysis will be presented. Lawrence Livermore National Laboratory is operated by Lawrence Livermore National Security, LLC, for the U.S. Department of Energy, National Nuclear Security Administration under Contract DE-AC52-07NA27344.

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Date submitted: 30 Jun 2008 Electronic form version 1.4