

Abstract Submitted  
for the DNP11 Meeting of  
The American Physical Society

**Position Sensitivity of the SuN (Summing NaI(Tl)) Scintillation Detector**<sup>1</sup> ILYA BESKIN, ARTEMIS SPYROU, STEPHEN QUINN, JESSICA PEACE, ANNA SIMON, NSCL/MSU, SUN TEAM — The astrophysical p-process is responsible for the synthesis of many proton rich nuclei. It involves photo disintegration reactions such as ( $\gamma$ , $\alpha$ ), ( $\gamma$ ,n) and ( $\gamma$ ,p) reactions. To try to understand the reaction flow and reproduce the p-nuclei abundances, we will try to study the inverse reactions, namely (p, $\gamma$ ) and ( $\alpha$ , $\gamma$ ). A beam of a heavy nuclei will be impinging on a H or He rich target, and by using the  $4\pi$   $\gamma$ -summing method, the cross section of (p, $\gamma$ ) and ( $\alpha$ , $\gamma$ ) reactions will be measured. To do so, the Nuclear Astrophysics group at NSCL (National Superconducting Cyclotron Laboratory) is developing a scintillation detector. The SuN (Summing NaI) detector consists of eight semicircular segments, each with three PMTs (photomultiplier tubes) attached. This  $4\pi$  gamma-summing detector will allow us to measure the cross sections of important p-process reactions. The goal of my research was to find the correlation between the position of an event in the crystal and the signal recorded by each PMT. By correcting for this position dependence of the signals the energy resolution of the detector was improved. First results from this investigation will be presented.

<sup>1</sup>NSF

Ilya Beskin  
NSCL/MSU

Date submitted: 03 Aug 2011

Electronic form version 1.4