

Abstract Submitted
for the DNP07 Meeting of
The American Physical Society

Simulation of the Focal Plane Detection Systems for the study of the $^{12}\text{C}(\text{a,g})^{16}\text{O}$ Reaction with St. George Recoil Separator¹ NOAH SCHROEDER, Valparaiso University — The $^{12}\text{C}(\text{a,g})^{16}\text{O}$ reaction is one of the most important reactions in nuclear astrophysics. The lowest energy we have reached is limited by the background in the detectors. To reduce the background, the St. George recoil separator is designed to study the radiative capture reactions with inverse kinematics. One key instrument of the recoil separator is the detection system at the focal plane used to identify the ^{16}O reaction products from the ^{12}C leakage through the recoil separator. Several focal plane detection systems were simulated with SRIM-2006 to determine the optimal conditions for particle identification. These simulations include a time of flight (TOF) and gas ionization chamber (GIC) configuration, as well as a double TOF configuration. Based on the simulation, the best detection solutions are recommended. Non-uniformities in the entrance window of the GIC and in the energy degrader of the double TOF system were also explored, and affect particle identification greatly, suggesting the necessity of tracking components to correct for large scale non-uniformities.

¹University of Notre Dame REU 2007

Noah Schroeder
Valparaiso University

Date submitted: 08 Aug 2007

Electronic form version 1.4