Using C++ and SRIM to improve energy resolution using the STARS/LiBerACE arrays BENJAMIN PAUERSTEIN, JACK SHAW, DANYI CHEN, TIM ROSS, RICHARD HUGHES, CON BEAUSANG, University of Richmond — An experiment was conducted at LBNL using the STARS/LiBerACE arrays in which a 25 MeV proton beam was incident on 154, 156, and 158Gd targets to study nuclei around the N=90 shape-change region. STARS uses a delta-E and E silicon detector telescope to identify the type and direction of emitted light, charged particles. Each CD shaped detector is segmented into 24 rings. The data sorting program approximates the angle at which a charged particle was scattered by choosing the angle required to hit the middle of the ring struck in the delta-E detector. This angle is then used to calculate energy losses in the dead layers, and hence the particle's total energy. This method is non-optimal as not all of the particles hit the detector at these angles, and improving the angular resolution should improve the energy resolution. SRIM was used to calculate particle energy loss per unit distance travelled in various materials; a C++ program was then written to obtain detailed energy loss calculations for particles as a function of angle and particle energy measured in the E detector. Preliminary results will be presented. This work is supported by the DOE under grants DE-FG02-52NA26206 and DE-FG02-05ER41379.

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