Abstract Submitted
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Extracting the Position from a Silicon Resistive Strip Detector using Digital Shaping Algorithms[1] HARRISON SIMS, Rutgers University/ORNL, SARAH LONSDALE, University of Surrey, ANDREW RATKIEWICZ, STEVEN PAIN, Oak Ridge National Laboratory, JOLIE CIZEWSKI, Rutgers University — Transfer reactions can be used to study single-particle structure of radioactive nuclei which are important for energy generation and nucleosynthesis in explosive astrophysical environments. The resolution of such measurements performed in inverse kinematics are dependent on the position resolution of the detected ejectile. The Oak Ridge Rutgers University Barrel Array (ORRUBA) of Silicon Resistive Strip Detectors (SRSD) was developed to measure light-ion products from transfer reactions in inverse kinematics with radioactive ion beams. The rise times of signals from resistive detectors are dependent upon the position of the incident charged particle; using analog electronics, the shaping time must be matched to the average response. By using a digital data acquisition system, event-by-event rise time information can be recorded, allowing for better optimized readout of resistive strip detectors. Investigations were made into the effectiveness of different shaping algorithms, such as smoothing filters and derivative filters, on the position resolution. Preliminary results demonstrate that improved position resolution can be obtained from the fast rise slope of the signals. Preliminary results and the first in-beam tests with the Gammasphere ORRUBA Dual Detector for Experimental Structure Studies (GODDESS).

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