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Improving the efficiency of the St. George detector system by recovering anomalous events[1] GUSTAVO DURAN, JERRY HINNEFELD, Indiana University South Bend, LUIS MORALES, MANOEL COUDER, University of Notre Dame — The St. George recoil mass separator at the University of Notre Dame is used to study the process of nucleosynthesis in the course of stellar helium burning by measuring cross sections for low energy (α,γ) reactions induced by heavy ions in inverse kinematics. The use of inverse kinematics ensures the reaction products are at far forward angles, where they can be efficiently detected. St. George separates the reaction products from the unreacted beam particles that exit the target in the same direction at a rate orders of magnitude higher than the product of interest. Some unreacted beam particles do reach the end of St. George, where ions are identified by measuring their energy and their time-of-flight over a known distance. Time-of-flight is measured with a pair of transmission detectors utilizing microchannel plates and the energy is measured in a silicon strip detector. A fraction of particle detections suffer from too-low energy signals in the silicon detector. These events are being studied using the ROOT data analysis framework, with the hope that the corresponding particle can still be unambiguously identified.

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Jerry Hinnefeld
Indiana University South Bend

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