

Measuring the detector efficiencies of a 6-detector Muon Tomography Station. K. DAY, M. STAIB, J.B. LOCKE, and M. HOHLMANN. High Energy Physics Lab A, Florida Institute of Technology, 150 West University Blvd, Melbourne, FL 32901. The FIT High Energy Physics Lab A uses a cubic foot muon tomography station for their research on detecting shielded nuclear contraband. However, there have been no in-depth studies of the efficiency of the station's individual detectors. To get an idea of how efficient these detectors are, measurements were taken for over 10,000 events with an empty station containing six GEM detectors. For every event and for each detector, a linear fit was calculated using five of the detector hits. This linear fit was extrapolated/interpolated to calculate an expected location for the sixth hit. If the actual sixth hit occurred within a particular range around this location, then the hit would be counted as "successful". A range of 0.75 mm, or \sim five times the spatial resolution of the detectors, was used. A tally was kept for the number of successful and total hits for each detector. The efficiency of each detector was then calculated as its number of successful hits divided by its total number of hits. A map of each detector's efficiency was drawn to look for possible systematic patterns in the results.