

Abstract Submitted  
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**Muon Tomography Model for Monte Carlo Simulation of Prototype Muon Telescope** RAUL PEREZ, SADMAN SHANTO, SAMUEL CANO, SHUICHI KUNORI, NURAL AKCHURIN, MOHAMMAD MOOSAJEE, CRISTOBAL MORENO, Texas Tech University — We aim to develop a portable muon detector with an excellent spatial resolution that will be able to image large structures in great detail. Muons are elementary particles that pass through matter, losing energy in the process. Muon tomography is a technique that exploits this phenomenon to construct images of large objects of interest. Our experiment involves the detection of a water tower and its contents using the prototype detector. A Monte Carlo (MC) Simulation was developed to improve our detector. The present MC Simulation utilizes GEANT4 combined with Cosmic-ray Shower Library (CRY) and ROOT for data analysis. CRY is being used to generate muons with an angular distribution and an energy spectrum corresponding to those of cosmic ray muons at sea level. GEANT4 is used for simulating the geometry of our detector/water tower, tracking muons, and monitoring their interactions with the geometry's material. The necessary information required for muon analysis are stored as ntuple files, which we use to analyze the muon density detected for different configurations of our geometry and construct 1D and 2D muon projections of the tower showing its contents. In an effort to improve our prototype we are comparing the simulated results with our experimental results.

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