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**Development of Portable Muon Telescope for Tomography**

CRISTOBAL MORENO, NURAL AKCHURIN, SHUICHI KUNORI, SHANTO SADMAD AHMED, SAMUEL CANO , MOHAMMAD MOOSAJEE, VICTOR BRADLEY, Texas Tech University — The primary motive of our research project is to use muon tomography in order to find hidden cavities within archeological excavation sites. Our target excavation site is Limyra, which is located in Southern Turkey. Muon tomography, the focus of our research, is a technique that is used to create three-dimensional maps of the dig sites using Coulomb scattering of the muon. This technique is used to find cavities inside volcanos, mountains, and archeological sites. We have been developing and testing prototypes of portable muon telescope for several years. The first prototype was built in 2019 with four trays containing scintillator bars and silicon photomultipliers. This prototype successfully produced images of a large water tank. A second prototype was built in 2020 which tested a new technique for readout signals. We are currently working on a third prototype. Our goal is to design and construct a muon telescope which can detect much smaller objects than the water tank and that will be operational at the Limyra hillside. Using GEANT4, we developed a Monte Carlo simulation program to optimize the design of these prototypes. In this presentation, we will report the performance of the third prototype muon telescope estimated from our Monte Carlo studies.

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