Muon tomography is based on recording the difference of absorption of muons by matter, as ordinary radiography does for using X-rays. The interaction of cosmic rays with the atmosphere produces extensive air showers which provides an abundant source for atmospheric muons, benefiting various applications of muon tomography, particularly the study of the inner structure of volcanoes. The MuTe (for Muon Telescope) is a hybrid detector composed of scintillation bars and a water Cherenkov detector designed to measure cosmic muon flux crossing volcanic edifices. This detector consists of two scintillator plates (1.44 m$^2$ with 30 x 30 pixels), with a maximum distance of 2.0m of separation. In this work we report the first simulation of the MuTe using GEANT4 –set of simulation tools, based in C++ – that provides information about the interaction between radiation and matter. This computational tool allows us to know the energy deposited by the muons and modeling the response of the scintillators and the water cherenkov detector to the passage of radiation which is crucial to compare to our data analysis.

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