

Radiography of the earth by using cosmic muon and atmospheric neutrino

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We considered the possibility of the High Energy Earth Sciences using cosmic ray muons and atmospheric neutrinos. We can explore density structures of volcanoes and the inside of the Earth by muon and neutrino radiography because they go through materials long. We can get details of the structure of volcanoes which is hard to get by the traditional method. There had been studies of muon radiography of volcanoes at Mt. Asama and Mt. Usu before, but we showed that this method can apply other active volcanoes in this study. Now, many researchers make an energetic effort, but information which we can get about structure of core-mantle boundary region is very restricted. We will be able to determine the structure of density of the Earth by working the IceCube Neutrino Detector which is being built now. In this study we obtain the zenith angle distribution of atmospheric neutrino by Monte Carlo Simulation, and determine best cut-off energy of neutrino.