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Study of the effect of seismically-induced geoelectric and geomagnetic fields on secondary particle detection at a LAGO site.

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The aim of this project is to study the potential effect that the changes in geoelectric and geomagnetic fields, produced by seismic activity, could have on the detection of secondary particles from extensive air showers in the atmosphere. For this purpose, simulations for flux of secondaries are performed using ARTI, a tool developed by the LAGO Collaboration that combines Magnetocosmics, CORSIKA, and Geant4 packages to account, respectively, for the propagation of a shower by a primary particle, the geomagnetic effect on particle flux, and the detector response. To run these simulations, the ground level is taken with reference to the position of the LAGO water Cherenkov tank at Universidad San Francisco de Quito (2200 m a.s.l.) in Ecuador. Regular conditions for the Earth's electromagnetic field are taken from records of fair-weathered days above the location. Variations from this regularity are introduced based on relevant studies on seismic activity. The results show that there exists an effect on the number of secondary particles at ground level, which could, in principle, be detected by a LAGO WCD detector.

Keywords

Simulations; secondary particle detection Geoelectric Field; Geomagnetic field; Seismic Activity; LAGO;

Collaboration

other (fill field below)

other Collaboration

LAGO

Subcategory

Experimental Methods & Instrumentation

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