

Earthquake Studies Using a LAGO Detector in Ecuador

Several studies have suggested the possibility of an interrelation between the occurrence of earthquakes and local disturbances in the geomagnetic field that could translate into an influence on the local cosmic ray flux at ground level. On April 16, 2016, Ecuador suffered one of the strongest earthquakes in its history. One of the Latin American Giant Observatory (LAGO) water Cherenkov detectors (WCD), located in the city of Riobamba-Ecuador, was monitoring the cosmic ray flux before, during and after this seismic event. In this work, we revisit the idea, already explored by other LAGO groups, of using the data acquired by LAGO WCDs to study the interrelation between seismic phenomena and the geomagnetic field modulation of the flux of atmospheric muons originated in extensive air showers. To do this, after noise removal, an implementation of the moving windows average (MWA) algorithm and a Fast Fourier Transform analysis were used to search for noticeable flux variations. No significant change was found around the time of the earthquake, but the analysis method was put in place and can be used for future, similar studies.

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