

The influence of thunderstorms on cosmic rays detected by the Solar Neutron Telescope in Sierra Negra

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Abstract:

The atmospheric electric field effects on cosmic rays detected by the Solar Neutron Telescope (SNT) in Sierra Negra, Mexico, were studied. The SNT is part of the Sierra Negra Cosmic Ray Observatory (SN-CRO), located at 4580 m a.s.l. [1]. We analyzed the data recorded by 3 SNT channels (S1, S2 and S3) during thunderstorms that occurred from October 2019 to April 2020. We used an electric field monitor, also installed in the SN-CRO, to identify these thunderstorms.

The S1, S2 and S3 channels detect charged particles with energy deposition thresholds of $E \geq 30$ MeV, 60 MeV and 90 MeV, respectively [2]. Significant variations associated with the atmospheric electric fields were observed. The effects could be generally explained by the muon and electron mechanisms.

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References:

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