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Influence of atmospheric electric fields on cosmic rays detected by the Solar Neutron Telescope at Sierra Negra

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Content

The atmospheric electric field effects on cosmic rays, detected by the Solar Neutron Telescope (SNT) at 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. We analyzed the data recorded by six SNT channels (S2, S3, S4, S2_withAnti, S3_withAnti and S4_withAnti) during thunderstorms that occurred from October 2019 to April 2020. To identify the thunderstorms, we used an electric field monitor, also installed in the SN-CRO. The S2, S3, S4, S2_withAnti, S3_withAnti and S4_withAnti channels detect charged and neutral particles with energy deposition thresholds of $E \geq 60$, 90 and 120 MeV, respectively. Significant variations, associated with the atmospheric electric fields, were observed in all six channels. The effects could be explained by the muon and electron mechanisms.

Summary

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