PARTICLE ACCELERATION IN THUNDERSTORMS

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Evidence for particle accleration in thunderstorm electric fields was first reported by the Baksan group in 1985 and more recently by the EAS-TOP group at the Utah ICR Conference in 1999. In this paper we present further evidence for particle acceleration in connection with thunderstorms, using large area (64 m^2) proportional counters and scintillators located at Mount Norikura Cosmic Ray Observatory at an altitude of 2770 m.
Atmospheric conditions at Mount Norikura in the Japanese Alps during the late summer of 2000, became very unstable in the afternoons between 4 and 8 August. Thunderstorms developed, followed by rainfall lasting several hours. We obtained evidence that, in association with this severe weather, particles (probably electrons) were accelerated to energies greater than 40 MeV (and perhaps greater than 100 MeV) in the atmosphere somewhere above the detector.