

Energetic Radiation Associated with Summer Thunderstorm Activity at the Summit of Mt. Fuji, Japan

Energetic Radiation from Thunderstorms and Lightning

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Energetic radiations caused by a summer thunderstorm have been observed at the top of Mt. Fuji, Japan, on 2013. The enhanced lasted for about several minutes, and was found to be high-energy gamma rays. The origin of variations might be the bremsstrahlung photons generated by the energetic electrons produced continuously with an intense electric field in the thundercloud.

Observation of the energetic radiation was performed at the meteorological observatory located at the top of Mt. Fuji, an altitude of 3776, Japan. Inside the observatory, 5-inch cylindrical-scintillation-detector covered with 2-mm thickness aluminum was installed during the summer from 2009 to 2013. The detectable energy range of the detector is from 150 keV to 23 MeV, which enables us to assign radionuclides. Atmospheric electric field (AEF) was also recorded on the roof of the observatory with a field mill.

On July 23 and 26, 2013, variations of the energetic radiation were detected. In particular, a remarkable enhancement of the energetic radiation was observed on July 26. During this period, intensive AEF was also observed. Since the energetic radiation with more than 3 MeV which is not terrestrial radionuclides was also clearly recognized, the enhancement of the radiation originates from the thunderstorm.

In this presentation, we will show the source location of the energetic radiation, comparing the radar echo vertical profile, speculating that such radiation occurs due to runaway-breakdown-type radiation.