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Observation of thundercloud radiation bursts using segmented plastic scintillators

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In 2011-2012, our group unexpectedly detected 3 thunderstorm-related radiation bursts during reactor neutrino measurement in a coastal area of Japan using an antineutrino detector which consisted of segmented plastic scintillators of 360 kg. For the purpose of further study of radiation bursts from thunderclouds, we performed observations of thundercloud radiation bursts at the top of Mt. Norikura in Japan in 2014 and 2016. The upgraded detectors were used for these observations, which consisted of plastic scintillators of 640 kg in 2014 and 1000 kg in 2016 respectively.
During three-month measurement in total at the mountaintop, 15 thundercloud gamma-ray bursts were observed. The energy spectra of the bursts extended up to 10 - 25 MeV and some signal enhancements showed interesting correlation with the fluctuation of field mill data. We investigated the runaway electron source in thunderclouds in both coastal area and mountain area by simulating the propagation of radiation bursts from thunderclouds and revealed an interesting difference between two locations. In the poster, we will show the latest results of the analysis and ongoing future plan.