

Fluctuations of cosmic ray and 38.2MHz intensity due to the atmospheric electric field of thunderstorm

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It is recently reported that atmospheric electric field in thunderstorm accelerates electrons and protons and excites gamma ray and/or muon. Since many electrons and protons are precipitating in Brazilian anomaly region, thus we can expect a remarkable increasing of gamma ray and/or muon during thunderstorm period in this region.

In order to examine the relationships between atmospheric electric field and particle acceleration phenomena, we installed atmospheric electric field detector and muon counter at Southern Space Observatory (INPE), Brazil in 2003, August. We summarize a preliminary observation results as follows.

- (1) Muon counter does not show any typical increasing in associated with increasing of atmospheric electric field during thunderstorm.
- (2) 38.2MHz (riometer) intensity shows a clear increasing in associated with increasing of atmospheric electric field during thunderstorm.
- (3) 7.3kHz (VLF direction finder) intensity also increases during thunderstorm.

We are interested in the relationships between 38.2MHz (riometer) intensity and atmospheric electric field fluctuations. It must be considered that atmospheric electric field accelerates electrons and such particles excite 38.2MHz. As described before, these phenomena may be more easily detected in Brazilian anomaly region. In order to make sure that these phenomena is special phenomena in this region or not, we are now comparing 38.2MHz intensity fluctuating obtained at Japan during thunderstorm.