

Abstract Submitted
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High Resolution Measurement of Atmospheric Radiation During Thunderstorms¹ MIHO ISHIGAKI, MARK GREENFIELD, MIKE KUBO, International Christian University, KAZUHISA KUMORA, Kanazawa University, PHYSICS-CHEMISTRY-ICU COLLABORATION, LLRL TATSUNOKUCHI COLLABORATION — Atmospheric γ radiation was continuously observed in Utsumomiya and Shishiku highland, Japan, both of which have frequent seasonal lightning. Using a Ge detector, this observation ranging from 100 keV to 3000 keV was aimed at examining the characteristic γ rays from atmospheric radioisotopes and 511 keV annihilation γ rays with higher resolution during thunderstorms. Previous work proposed that excess γ rays might be from radioisotopes such as ^{39}Cl or ^{38}Cl produced via nuclear reactions on atmospheric elements from bombardment of energetic protons or photons inside thunderclouds. Although these gamma ray energies have not yet been observed, the number of 511 keV annihilation γ rays was slightly more than that observed during storms without lightning. Anomalous increases in the ratio of ^{214}Bi to ^{214}Pb (radon progeny) had also been observed during thunderstorms. Studies using an air filter near the Ge detector, increasing the observable volume of air exposed during thunderstorms, are in progress in order to elucidate the cause of this lightning enhanced radiation.

¹M. B. Greenfield et al., Journal of Applied Physics 93 no. 3 (2003) pp 1839-184.

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