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Intense γ radiation from radon progeny accreted in/on rain during and following thunderstorms M.B. GREENFIELD, A. IWATA, N. ITO, M. ISHIGAKI, K. KUBO, Int'l Christian Univ., K. KOMURA, LLRL Kanazawa Univ. — Delayed atmospheric γ's decaying with a half-life of 10s of minutes[1], has been observed in Japan and in Florida associated with natural and triggered lightning, respectively. This activity may be from 1) excess precipitation of positively charged radon progeny or 2) decay of ejectiles from nuclear reactions initiated by protons or photons. Activity condensed from 5-20 liters of rain, via ion exchange resins, was measured with 2π solid angle, by a 50%, high resolution Ge detector. Activities from ^{214}Bi and^{214}Pb, initially exceeding up to 100's of cts/sec, decayed with their characteristic half-lives of 19.7 and 26.9 minutes, respectively[2]. Atmospheric radiation was also observed in close proximity to triggered lightning at the Lightning Research Lab in Florida. In both cases excess delayed activity with thunderstorms observed at ground level is almost entirely due to increased precipitation of radon progeny. An enhancement of the 511 keV annihilation peak may be from positron decay of ^{11}C, ^{18}F, ^{13}N following lightning induced nuclear reactions. Identification of corresponding 20, 10 and 100 minute half-lives, respectively, requiring closer lightning, greater volumes of collected rain water, and/or reduction in sample preparation times is in progress. [1]Greenfield et al., J. of Appl. Phys. **93,** 1839 (2003); [2] see next abst.

Mark Greenfield
Int'l Christian Univ.

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