

Can we estimate vertical profile of radiation caused by deposited radioactive materials from atmospheric electric field measurement?

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The 2011 off the Pacific coast of Tohoku Earthquake generated large tsunami resulting in serious damage to the Fukushima Daiichi nuclear power plant (FDNPP). The damage caused radioactive materials be discharged to the environment. After the discharge, transported radioactive materials were deposited around east Japan. The radioactive deposition modulated atmospheric electricity such as the decrease of atmospheric electric field (AEF) for several months. From the ground-based observations of AEF, detectable modulated area on the ground was estimated only within a few hundred kilometers from FDNPP. In addition, we estimate the modulated height above the ground by applying the observed data to a global electric circuit model, so that the modulated height was up to approximately 1 km, which agrees with aerial radiation monitoring. Therefore, the ground-based AEF observation might contribute to estimating the vertical profile of radiation.

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