

Correlation-research about fluctuations of the air dose rate and weather conditions

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Pacific Ocean off the coast earthquake of magnitude 9.0 occurred on March 11, 2011. Fukushima Daiichi Nuclear Power Station has meltdown By the earthquake and tsunami, and Surrounding environment is contaminated with radioactive materials. International Nuclear Event Scale of the Fukushima Daiichi Nuclear Power Station accident is the level 7 (serious accident). Accident of the same level is the second case since the Chernobyl nuclear power plant accident that occurred in Ukraine on April 26, 1986. The Cs-134 and Cs-137 are radioactive material released by accident increased significantly the spatial dose rate that indicates the radiation dose per unit time space, a lot of the people who lived around the Fukushima Daiichi nuclear power station were no longer able to live in the place. There is a lot of land where decontamination work has not started yet in an area around the Fukushima Daiichi nuclear power station.

Released radioactive materials take atmospheric condition turbulent flow, do advection and stick to a ground level in the atmosphere. After depositing in a ground level, radioactive materials are floating by atmospheric condition turbulent flow and deposit again to other places. Radioactive materials repeat such process. The weather condition influences such process deeply. The model of the prediction which indicates attenuation of the new spatial dose rate which considered its weather condition is needed.

In this study, we refer to the correlation that the weather conditions and fluctuation of the air dose rate which is considered the radioactive decay.

To determine the correlation coefficients between the fluctuations of the air dose rate and various weather conditions in considering the periodicity obtained by the spectral analysis. As a result, it became clear that there is a strong negative correlation between the fluctuation of the air dose rate and the soil water. This result may be the trigger which makes new methods that can estimate exposure risk.