

Intensity of atmospheric radioactivity over East Japan after Fukushima nuclear plant accident

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Fukushima nuclear plant accident has released a huge amount of radioactive matters to the earth environment via the atmosphere and the ocean. Monitoring of atmospheric radioactive matters is significant to understand their emission to the atmosphere and their transport processes as well as estimate the internal exposure by the aspiration.

Several investigators belonging to Japanese Geoscience union, the Geochemistry society of Japan, the Japan Society of Nuclear and Radiochemical Sciences voluntarily took part in the activities for monitoring the radioactive matters released to the environment. Atmosphere team has monitoring atmospheric radioactive matters including Cs-134, Cs-137 and I-131, since late March 2011. The monitoring was conducted at more than 20 sites over Japan till May 2011, it was conducted at 11 sites surrounding the Fukushima nuclear plant till September 2011, and it is continued at 4 sites, Fukushima-city, Koriyama-city, Marumori-town and Hitachi-city, located at a distance of about 80 km from the nuclear plant. The atmospheric samples are obtained with a high-volume air sampler, and gamma-ray intensities from the samples are measured with a cooled Ge-detector.

The monitoring revealed that the distribution and variation of the atmospheric radioactivity intensity. It rapidly decreased in April and May, 2011, and it did not change significantly between June and August. It often showed large, 1-2 orders of magnitude, increase events. These variations can be understand the variation of emission amount of radioactive matters from the Fukushima nuclear plant, and their transport from there to the sampling sites. The atmospheric radioactivity intensity decreased when the radioactive matters from the Fukushima nuclear plant was not transported to the sampling site, but it remains significantly amount (base line level) higher than that before the accident. The baseline level is positively correlated with the amount of the fallen radioactive matter at the sampling sites, indicating that the re-emission of the radioactive matter from soil or trees contributed to the baseline radioactivity level.

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