



Re-suspension of the radioactive fallout after the Fukushima accident: risk of internal dose during the first week and the first two months

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The nuclear accident at the Fukushima Dai-ichi Nuclear Power Plant in March 2011 contaminated an area of more than 100 km in diameter by radioactive material with amount of about 10-20% of that by the Chernobyl accident. According to the Chernobyl experience, a part of fallout radionuclide is expected to be re-suspended by wind, causing possible risk of internal dose. However, this re-suspension process and its amounts have not been studied very much due to the difficulty of direct measurement of low-density dusts. To estimate forms and periods of the re-suspension of the radioactive fallout, we used both the radiation dose rate data and vertical (downward) component of the DC electric field near the ground, or potential gradient (PG) at Kakioka, 150 km away from the accident site. The data indicates:

- (1) During 14-15 March, the radioactive dust is most likely suspended in the air near the ground.
- (2) During 2-7 UT on 16 March, the radioactive dust is most likely blown up from the surface by the strong wind from the non-contaminated area.
- (3) During 16-20 March, the radioactive dust most likely stayed re-suspended.
- (4) After the wet contamination on 20 March until late April, the radioactive fallout on the ground are re-suspended during daytime by daily convection due to sunshine, and transported to downwind direction.
- (5) At more than 30 km distance from the accident site, the re-suspension most likely ceased by the end of April. However, no data is available within 20 km distance from the accident site.

Yamauchi, et al. (2012): Settlement process of radioactive dust to the ground inferred from the atmospheric electric field measurement, *Ann. Geophys.*, 30, 49-56, doi:10.5194/angeo-30-49-2012.

Yamauchi (2012): Secondary wind transport of radioactive materials after the Fukushima accident, *Earth Planet Space*, accepted for publication.