

## Time series of atmospheric radiocesium just after the accident at two SPM monitoring sites near the Fukushima Daiichi Nuclear Power Plant

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The first retrieval of hourly atmospheric radiocesium concentrations during March 12-23, 2011 just after the Fukushima Daiichi Nuclear Power Plant (FD1NPP) accident was already published by measuring radionuclides in Suspended Particulate Matter (SPM) on the filter-tapes installed in SPM monitors with beta-ray attenuation method at 40 sites operated by local governments in the air pollution monitoring network of eastern Japan (Tsuruta et al., Sci. Rep., 2014). Since then, hourly atmospheric radionuclides in SPM have been measured at around 100 SPM monitoring stations, and the dataset has been also published on a website (Oura et al., JNRS., 2015). After that, the used SPM filter-tapes at two SPM monitoring stations were offered, which were operated even after the Great East Japan Earthquake and tsunami on March 11, 2011. One (site F) was located in the Futaba town, about 4 km northwest of the FD1NPP, and the other (site N) was in the Naraha town, 16 km south of the FD1NPP. At first, we checked if these SPM monitors were normally operated even after the Great Earthquake and tsunami, or not. Considering from various points of view, we judged that the SPMs at these sites were properly collected on the filter-tapes as usual. Then, Cs-134 and Cs-137 in the SPMs were measured by Ge detectors. The radiation dose rates at the monitoring stations located outside the FD1NPP and FD2NPP by the Fukushima prefecture, and inside by TEPCO, and the meteorological data by the Japan Meteorological Agency were also used for further analysis. In this paper, we will briefly introduce new findings from the hourly Cs-137 concentrations during March 12-23, 2011, which had not been recognized by the previous analyses. At site F, six peaks of high Cs-137 concentrations ( $\text{Cs-137} > 100 \text{ Bq m}^{-3}$ ) were found on March 12-13, 15-16, and 18-20, 2011. Most of these high radionuclides were transported as plumes/polluted air masses to the northwest or north, which were already recognized in the previous paper. In addition, at site N, six peaks of high Cs-137 concentrations were also found on March 15-16, 20-21, 2011. Most of them were also transported to southern Fukushima and the Tokyo Metropolitan Area. Some of them at sites F and N, however, were identified as new plumes/polluted air masses. Furthermore, the peak times of radiation dose rates measured at the monitoring stations located near two SPM sites, were well correlated with those of Cs-137 concentrations. These findings greatly contribute to understand how radionuclides were released and transported from the FD1NPP just after the accident. We greatly thank to the Fukushima prefecture for offering the used filter-tapes at two SPM monitoring stations.

Keywords: Fukushima Daiichi Nuclear Power Plant, Radiocesium, Suspended particulate matter, Air pollution monitoring network, Time series