



Development of observed precipitation and meteorological database to understand the wet deposition and dispersion processes in March 2011

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The transport and diffusion of the radioactive pollutants from the Fukushima-Daiichi NPP in the atmosphere caused a disaster for residents in and around Fukushima. Studies have sought to understand the transport, diffusion, and deposition process, and to understand the movement of radioactive pollutants through the soil, vegetation, rivers, and groundwater. However, a detailed simulation and understanding of the distribution of radioactive compounds depend on a simulation of precipitation and on the information on the timing of the emission of these radioactive pollutants from the NPP. Further, precipitation type and its amount affect the various transport process of the radioactive nuclides.

Hence, this study first examines the qualitative precipitation pattern and timing in March 2011 using X-band radar data from Fukushima University and three-dimensional C-band radar data network of Japan Meteorological Agency. Second, by collecting rain-gauge network and other surface meteorological data, we estimate quantitative precipitation and its type (rain/snow) according to the same method used to create APHRODITE daily grid precipitation (Yatagai et al., 2012) and judge of rain/snow (Yasutomi et al., 2011).

For example, the data clarified that snowfall was observed on the night of Mar 15 into the morning of Mar 16 throughout Fukushima prefecture. This had an important effect on the radioactive contamination pattern in Fukushima prefecture. The precipitation pattern itself does not show one-on-one correspondence with the contamination pattern. While the pollutants transported northeast of the NPP and through north Kanto (about 200 km southwest of Fukushima and, 100 km north of Tokyo) went to the northeast, the timing of the precipitation causing the fallout, i.e. wet-deposition, is important.

Although the hourly Radar-AMeDAS 1-km-mesh precipitation data of JMA are available publicly, it does not represent the precipitation pattern in Nakadori, in central Fukushima prefecture. Hence, we used 10-minute interval X-band radar, located in north Nakadori to determine the start and detailed horizontal pattern (120-m mesh) of the precipitation.

The developed precipitation and other meteorological dataset will be released to the project Fukushima-IRIS site (<http://iris.dpri.kyoto-u.ac.jp>, or linked from <http://center.stelab.nagoya-u.ac.jp/member/akiyoyatagai/>). The project aims to make a database to understand the initial meteorological condition. Various useful sites with meteorological data and other physical information on March 2011 have already linked at the site. This project is being supported by the Disaster Prevention Research Institute, Kyoto University.