**Fukushima Dai-ichi and the Ocean: 10 years of study and insight Abstract Submission Form : Entry # xx**

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**Session**

What happened

**Abstract Title (English, limited to 300 characters)**

Review of model intercomparison projects (MIPs) of atmospheric dispersion model for 137Cs emitted from Fukushima Daiichi Nuclear Power Plant ~ MIPs with identical source term and meteorological data.

**Abstract (English)**

Two model intercomparison of Projects (MIPs) of atmospheric dispersion model targeting on $^{137}$Cs released from Fukushima Daiichi Nuclear Power Plant (FDNPP) on March 2011 were conducted. Twelve models, which include both the Lagrangian-based (dispersed) models and the Eulerian-based models, participated in the MIPs. Both MIPs were conducted using an identical source term (Katata et al. 2015), identical meteorological data, and identical horizontal grid resolution to exclude the uncertainties of the model originated from them. The horizontal grid resolution of one MIP was set as 3 km (Sato et al. 2018) and that of the other MIP was set as 1 km (Sato et al. 2020). The meteorological data was created by the Japanese operational weather forecast model coupled with the data assimilation system (Sekiyama et al. 2015; Sekiyama and Kajino 2020). Observation data of atmospheric $^{137}$Cs obtained from the operational aerosol sampling of the national suspended particle matter (SPM) network (Oura et al. 2015) and the deposition amount of radionuclides by the aircraft (MEXT, 2011) were used for the evaluation of the model. Our analyses indicated that most of the model well simulated high concentration event (Plume) of the atmospheric $^{137}$Cs measured by the SPM network. The total deposition amount of $^{137}$Cs and dry deposition fraction to the total deposition simulated by each model differed largely from each other, even if the identical source term and the identical meteorological data were used. Our analyses also indicated that meteorological data were most critical for reproducing the atmospheric $^{137}$Cs events, and the extent of the horizontal diffusion and the deposition were critical for better performance of the model if the meteorological field was reasonably simulated. The comparison of the results between the two MIPs elucidated that the fine grid resolution is required to simulate atmospheric $^{137}$Cs measured by the SPM site in the vicinity of FDNPP, but the use of the fine grid resolution does not always improve the performance of the models especially for areas distant from the FDNPP.
The results of both MIPs elucidated that the good performance of some models improved the performance of the multimodel, highlighting the advantage of using a multimodel ensemble.