T1.5-O2. Estimation of radionuclide releases from the Fukushima nuclear accident using the Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) model and the International Monitoring System (IMS) air concentration measurements

An emission inversion system has been built based on the Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) model and a cost functional. The release estimates are found by minimizing the cost functional which mainly measures the differences between the model predictions and the actual air concentration measurements. A transfer coefficient matrix (TCM) defining the potential impacts of each release segment on all measurements is created first and then repeatedly used throughout the minimization. Tests using pseudo observations generated with the same model show that computing logarithmic concentration differences between model and observations is better than using the concentration differences in the cost functional. The sensitivities of the inverse system to observational errors and model uncertainties are discussed before the estimates of the caesium-137 and iodine-131 releases from the Fukushima nuclear accident using the International Monitoring System (IMS) air concentration measurements are presented.

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