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Development of the Global Atmospheric Transport and Backtracking System Using Lagrangian Particle Dispersion Model

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We developed global atmospheric transport and backtracking system using FLEXPART Lagrangian particle dispersion model for the purpose of predicting radioactive materials movement in case of neighboring country's nuclear accident. In addition, the system can be used to estimate the source location when unusual peak was detected in radiation monitoring stations in Korea. As an input to this system, we can choose two meteorological data, namely the Korea Meteorological Administration(KMA)'s global meteorological data and the National Centers for Environmental Prediction (NCEP) Global Forecast System (GFS) data. KMA produces global meteorological data using Unified Model system which was introduced from the UK Met Office. Meteorological data's spatial resolution is about 25 km and its temporal resolution is 3 hour. GFS data had 26 model levels and a resolution of $0.5 \times 0.5^{\circ}$ globally. Using this system, we can evaluate the characteristics of transport and dispersion of radioactive materials released from the source region. Also, we can estimate the possible source regions using observed data and Source-Receptor Sensitivity Matrix (SRSM). SRSM can be calculated using FLEXPART model in backward mode. We adopted Graphic User Interface (GUI) system, so users can run and check the model results easily.