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Emergency preparedness for the release of radionuclide from a hypothetical accident of a nuclear power plant in Korea

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The Lagrangian Particle Dispersion Model (LPDM) with the UM-LDAPS meteorological model in the horizontal grid scale of 1.5 × 1.5 km^2 centered the power plant site has been employed to archive radionuclide (^{137}Cs) dispersion database for the emergency responses at the early stage of the hypothetical accidental releases of radionuclide from the Uljin Nuclear Power Plant in Korea. The database includes 72 synoptic time-scale cases in a year. Each case has the spatial distributions of the hourly mean surface concentration, column integrated concentration and the hourly total deposition (wet+dry) of radionuclide in the model domain simulated by LPDM by releasing a Lagrangian particle per minute for 5 consecutive days at the site. The worst synoptic time-scale case (the highest surface concentration occurring case in the model domain) among 72 cases is chosen to be performed the LPDM model with the time dependent emission rate of the Fukushima nuclear power plant accident for the first 5 days for the provision of the required information for emergency responses including the affected areas, the moment of arrival of potential plume at critical locations, health effect, protective action guides at the early stage of the accident to assist emergency response managers in taking action to protect the public and environment. It is found that the presently archived database is very useful for the emergency response managers to take protective actions where and when concentrations of radioactivity are projected to be high and to establish the evacuation plans and emergency planning zones at the early stage of the accident by choosing a proper synoptic time-scale case from the archived database.

Biography

Soon-Ung Park holds a BSc in Meteorology from the Seoul National University in Korea, an MSc in Meteorology from the University of Wisconsin-Madison in USA and a PhD in Atmospheric Sciences from Oregon State University in USA. He had served at the Department of Atmospheric Sciences of Seoul National University in Korea as a Professor before he retired in 2006. As a Professor Emeritus of Seoul National University, he founded "Center for Atmospheric and Environmental Modeling (CAEM)" to pursue further studies on atmospheric environmental issues including air pollution dispersion, radionuclide dispersion, anthropogenic aerosols, dust aerosols, acidic rain and carbon cycles in forests. He has developed an operational Asian Dust Aerosol Model 2 (ADAM2) that is now used as a forecasting model in Korea Meteorological Administration (KMA). He is interested in the development of an Aerosol Modeling System including both dust and anthropogenic aerosols.

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