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Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

Local scale statistical analysis of the accidental release from Fukushima Nuclear Power Plant

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Nuclear security has developed much since the Chernobyl accident due to the international co-operation and strict regulations. However, the recent incident in Fukushima pointed out again the importance of reasonable emergency scenarios based on accurate air dispersion modelling in order to protect human life and the environment in case of an accidental release caused by a natural disaster or any other reason. In spite of the Chernobyl accident, the impact of the Fukushima accident was concentrated on a local scale, but the duration of radioactive release was longer than a month. Although the exact amount and composition of the released chemical substances are not known, the spatial distribution of the pollution can be estimated based on meteorological observation data throughout the release time. The ALOHA local scale air dispersion model developed in a co-operation between NOAA and EPA was applied in the Fukushima case. Based on meteorological observation data from the two WMO stations (Fukushima and Onahama), a hypothetical release of a passive tracer gas (xenon) was simulated in every 6 hour between 12 March and 15 April, 2011. The results provide with a fast estimation for the spatial distribution of radioactive pollution within 10 km of the power plant. We used ALOHA with eleven years' meteorological data from the two WMO stations to determine statistically the most endangered zones in every month. The results give a fast estimation for the consequences of a further release assuming a passive tracer release in approximately 10,000 cases between 2000-2010.