



Modelling of the regional and long-range transport of radioactivity from the Fukushima nuclear accident at the Austrian Weather Service: Estimate of release rates and first model validation based on CTBTO measurement data

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On 12 March 2011 at about 6:30 UTC (7:30 CET), the first explosion was reported from block 1 of the nuclear power plant in Fukushima Daiichi. Only minutes afterwards, the Meteorological Service of Austria (ZAMG) started its model simulation of the event. As transport model, the Lagrangian Particle Diffusion model FLEXPART Version 8 based on ECMWF input data was used. The simulated substances were I-131, Cs-137 and Xe-133. As National Data Centre of Austria for the verification of the Comprehensive Nuclear Test Ban Treaty (CTBT), ZAMG has real-time access to the global radioactivity data of the CTBT Organization (CTBTO). CTBTO stations are distributed all over the globe and measure radioactive particles as well as Xenon gases with very high accuracy. These data were used to validate the model simulation, and to estimate the source terms of I-131, Cs-137 and Xe-133. First results show that the model worked well regarding transport, but underestimated the concentrations of I-131 transported towards Europe. Furthermore, it was demonstrated that significant amounts of I-131, Cs-137 and Xe-133 were set free during the first days, exceeding initial estimates by orders of magnitude.