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Modelling the global atmospheric transport and deposition of radionuclides from the Fukushima Dai-ichi nuclear accident.

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We modeled the global atmospheric dispersion and deposition of radionuclides released from the Fukushima Dai-ichi nuclear power plant accident. The EMAC atmospheric chemistry – general circulation model was used, with circulation dynamics nudged towards ERA-Interim reanalysis data. We applied a resolution of approximately 0.5 degrees in latitude and longitude (T255). The model accounts for emissions and transport of the radioactive isotopes ^{131}I and ^{137}Cs, and removal processes through precipitation, particle sedimentation and dry deposition. In addition, we simulated the release of ^{133}Xe, a noble gas that can be regarded as a passive transport tracer of contaminated air. The source terms are based on Chino et al. (2011) and Stohl et al. (2012); especially the emission estimates of ^{131}I are associated with a high degree of uncertainty. The calculated concentrations have been compared to station observations by the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO).