



Global risk from the atmospheric dispersion of radionuclides by nuclear power plant accidents

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We estimate the global risk from the release and atmospheric dispersion of radionuclides from nuclear power plant accidents using the EMAC atmospheric chemistry–general circulation model. We included all nuclear reactors that are currently operational, under construction and planned or proposed. We simulated atmospheric transport and decay, focusing on ^{137}Cs and ^{131}I as proxies for particulate and gaseous radionuclides, respectively. We implemented constant continuous emissions from each location in the model and simulated atmospheric transport and removal via dry and wet deposition processes. We present risk maps for potential surface layer concentrations, deposition and doses to humans from the inhalation exposure of ^{131}I . The estimated risks exhibit seasonal variability, with the highest surface level concentrations of gaseous radionuclides in the Northern Hemisphere during winter.