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Source Detection and Risk Evaluation of Ru-106 Event of 2017 in Europe

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Considerably high levels of Ru-106 were measured by some air monitoring stations in Europe at the end of September and beginning of the October in 2017. Routine measurements revealed Ru-106 levels that vary between 10 to 100 mBq/m3 with maximum values reaching as high as 150 mBq/m3 during this period. Based on this motivation, a mathematical modeling study for the atmospheric transport of Ru-106 was performed to locate possible sources of this radionuclide. Using inverse modelling methods, potential Ru-106 source were analysed via FLEXPART, a Lagrangian particle dispersion model. The model was used in backward mode to locate possible sources of Ru-106 event of 2017. The model was later used in forward mode to simulate atmospheric dispersion and ground level deposition of Ru-106 in Europe considering the possible identified sources. The backward and forward simulations performed in this study used ECMWF datasets. Concentration and deposition results were compared with available data recorded by the European environmental radiological monitoring networks. In addition, possible transport routes and deposition of Ru-106 in Turkey were also estimated to identify potentially contaminated regions in Turkey. Finally, various dose values were estimated using model outputs for health and environmental risk evaluation purposes.

Promotional text

It is a study made to enlighten the source of the Ru-106 event in 2017. Inverse atmospheric dispersion modeling method were used and dose values were estimated to reveal health effect.

Primary authors: Mr BILGIC, Efem (Dokuz Eylul University); Mr GUNDUZ, Orhan (Dokuz Eylul University)

Presenter: Mr BILGIC, Efem (Dokuz Eylul University)

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