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-based assessment of radionuclide migration in the geosphere by using different type of data - Northern Bulgaria case study

Modeling of radionuclide transport is concerned as a key issue of the evaluation of environmental and people safety in connection with eventual release of radionuclides into the geosphere. The classical assessment of the transport is based on convection-diffusion equation (CDE), which terms describe mathematically the infiltration and solute transport into the soils. In the most cases considering variably saturated medium, the infiltration rate is the leading force of the radionuclides movement. There are different methods of estimation of the infiltration rate, e.g. by direct measurements with lysimeters, by experts decision based on the annual precipitation or by water-balanced models. The aim of the study is to represent an approach for assessment of vertical migration of key radionuclides from the soil surface subject to differently determined infiltration rates, i.e. by experts choice over literature data, and by in situ measurements of meteorological data (water balance approach) both for the case of Northern Bulgaria including the vicinity of Kozloduy NPP. The results from the simulations are analyzed from the viewpoint of the radionuclide flux extend in the soil and respectfully from the environmental and human risk prediction.

Primary author: ANTONOV, Dimitar (Geological Institute Strashimir Dimitrov)

Presenter: ANTONOV, Dimitar (Geological Institute Strashimir Dimitrov)

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