TEMPORAL VARIABILITY OF DRY AND WET DEPOSITION PATTERNS DURING ATMOSPHERIC TRANSPORT FROM POTENTIAL RADIOACTIVE POLLUTION SOURCES IN EURO-ARCTIC REGION

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The temporal variability of dry and wet deposition patterns due to atmospheric transport from selected risk sites in the Euro-Arctic region is analyzed. The main questions addressed are the following: Which geographical territories of the Euro-Arctic region are at the highest risk from hypothetical releases at the risk sites? What are probabilities for atmospheric transport and deposition on different neighbouring countries in case of accidents at the risk sites? To answer these questions we applied two research tools. The first is an atmospheric long-range dispersion model, the Danish Emergency Response Model of the Atmosphere (DERMA). It was employed to simulate atmospheric transport, dispersion, and deposition of pollution during hypothetical accidental releases at selected risk sites in the Euro-Arctic region. As input data for modelling purposes, the ECMWF and DMI-HIRLAM meteorological gridded fields were used. Several important characteristics were calculated: 1) air concentration in the surface layer, 2) time-integrated air concentration in the surface layer, 3) dry deposition on the underlying surface, and 4) wet deposition on the underlying surface. The second research tool is a set of statistical methods (including exploratory and probability fields analyses) to evaluate dispersion modelling results in the form of various indicators of a risk site’s possible impacts on geographical regions, territories, countries, cities, etc. Among these indicators are the summary and average fields for: integrated air concentration in the surface layer and deposition patterns. To evaluate the temporal variability of these indicators, analyses were performed annually, seasonally, and monthly.