(1) ATMES - Atmospheric Transport and dispersion Models of global and regional scales for climatic Environmental Studies

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(3) Available modes for the model runs: Research

(4) Components & processes: Atmosphere & Physical, Chemical

(5) Brief model description

ATMES is applied for direct and inverse modeling for climatic environmental studies with objects of studies: Siberian, Far East, and Arctic (Fig. 1) regions in the global system.

Methods and algorithms: For global scale, meteorological parameters are taken from reanalysis databases in the frames of scenario approach. They are prepared with the help of orthogonal decomposition methodology described by *Penenko & Tsvetova (2008)*. Regional models can incorporate the global "climatic" data. Weak-constraint variational principles with diagnosis of uncertainty in the process models serve as a basis for consistent description of direct and inverse problems.

Direct problems: transport and dispersion of pollutants from point and distributed sources; Euler and Lagrange versions.

Inverse problems: sensitivity studies with direct and adjoint systems; assessment of risk /vulnerability/ observability for region-receptors; identification of sources; assessment of transboundary interactions between regions; etc.
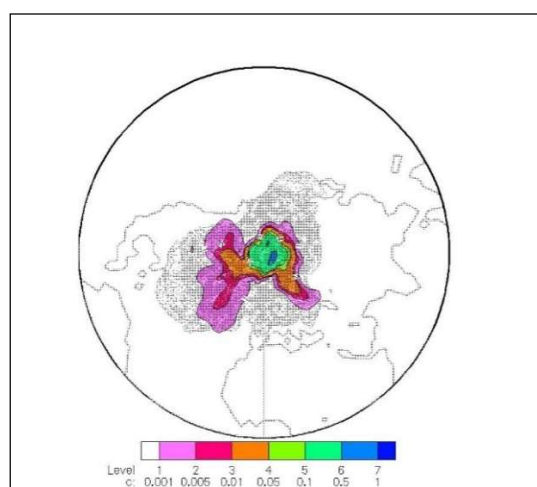

Fig.1: Risk function. The fragment of the scenario calculations for an estimation of the risk/vulnerability of the Arctic region with respect to the existing and potential sources of impurity. Inverse problem solution

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