# Method of balanced identification in the inverse problem of transport and diffusion of atmospheric pollution

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The problem is considered of selection of mathematical description based on 2D diffusion-transport model for the solution of the inverse problem of atmospheric pollution dispersion.
The following problems were studied:
• The estimation of distribution and sources of the atmospheric aerosol pollution (PM10) in the North of France. The dataset consists of 12 stations of Atmo Hauts-de-France pollution measurement network.
• The evaluation of pollutant emissions and the average wind rose for contamination sources with known positions. Measurements of pollution of soil and lake's water by metals (Cu, Ni, etc.) were obtained in the Kola Peninsula in Russia at about 100 stations.
To select the best suitable model we use the method of balanced identification consisting in searching for an optimal compromise between the complexity of the mathematical model and the proximity of its solution to the experimental data. In the result, we obtained unknown distributions of pollution and sources, and the numerical estimate of correspondence between retrieved and experimental data - root mean square error of cross-validation. This numerical estimate allows selecting the model that corresponds to the quantity and to the quality (the accuracy) of available experimental data among multiple candidate models.