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Artificial neuralnetworks forestimating the atmospheric pollutant sources

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Abstract:
A relevant issue for atmospheric environment is the estimation of the area source pollutant strength. This issue is considered as an inverse problem in the atmospheric pollution dispersion. For the inverse analysis, an area source domain is considered,where the strengthof such area source term is unknown. The inverse problem is solved by using a supervised artificial neural network: multi-layer perceptron. The connection weights of the neural network are computed from the delta rule (the learning process).

In our numerical experiments, the forward problem is adressed by a source-receptor scheme, where a regressive Lagrangian model is applied to compute the transition matrix.

The inverse problem methodology is tested with synthetic observational data, from measurements points in the physical domain.