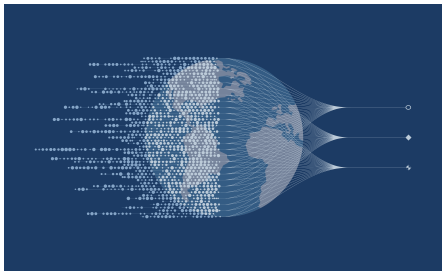

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# -Scale Air Pollution Source Identification Using Backward Particle Dynamics

Air pollution, including radiological pollution, is one of the most harmful consequences of industrialization because of its strong influence on both human health quality and climate in general. Often a need appears to identify one single strong source of air pollution. Such a source may be the result of accident or routine release from nuclear industry. We propose a new algorithm for a single pollution source localization. The proposed algorithm uses the source-receptor matrix concept and assumption about the linearity of pollution transport that allows us to use the pollution spread simulations backward in time. In particular realization, we make use of the weather regional forecast model WRF for airflow simulation and of lagrangian particle dispersion simulation software FLEXPART-WRF for pollution advection simulation both forward and backward in time. As a result, our algorithm produces the semi-empirical heatmap of possible pollution source locations with marked point of the biggest probability and estimative emission intensity at this point as a function of time. The algorithm is tested on several synthetic and practical cases and compared with other solutions in this field. Results on the European Tracer Experiment data demonstrate competitiveness of the proposed approach and its applicability to radioactive pollution monitoring.

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