# Improving plume forecasts using Fukushima data

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Forecasting how plumes of particles, such as radioactive particles from a nuclear disaster, will be transported and dispersed in the atmosphere is an important but computationally challenging task. During the Fukushima nuclear disaster, operational plume forecasts were produced each day, but as the emissions continued, previous emissions were not included in the simulations used for forecasts because it became impractical to rerun the simulations each day from the beginning of the accident.

Draxler and Rolph examined whether it is possible to improve plume simulation speed and flexibility as conditions and input data change.

The authors used a method known as a transfer coefficient matrix approach that allowed them to simulate many radionuclides using only a few generic species for the computation. Their simulations work faster by dividing the computation into separate independent segments in such a way that the most computationally time- consuming pieces of the calculation need to be done only once. This makes it possible to provide real-time operational plume forecasts by continuously updating the previous simulations as new data became available. They test their method using data from the Fukushima incident to show that it performs well.

**More information:** Evaluation of the Transfer Coefficient Matrix (TCM) approach to model the atmospheric radionuclide air concentrations from Fukushima , *Journal of Geophysical Research-*

*Atmospheres,* doi:10.1029/2011JD017205 ,
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