



Reconstruction of a tracer dispersion event in case of emergency using advanced data assimilation techniques

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An account on the application of advanced inverse modelling techniques to the reconstruction of the source(s) of a pollutant is given. These methods are especially efficient on pollutants with linear physics (tracers of opportunity, radionuclides, heavy metals, etc.) They have been validated against ETEX-I, the Algeciras incident and the Chernobyl accident, with satisfying results (the amount of released pollutant is correctly identified in all cases.) Once these results are summarised, it will be shown how the technique can be adapted to the case of an accidental release of pollutant, with a view to an emergency response.

A test is set up on the real data of ETEX-I. Observations are assimilated as soon as they arrive by a sequential updating. The assimilated plume (knowing the observations only) is compared to a reference simulation where the true source is known. In the specific context of ETEX-I, 15 hours after the release start are necessary to identify the source (location, released mass). The space correlation between the two runs is increasing with time and eventually gets close to one.