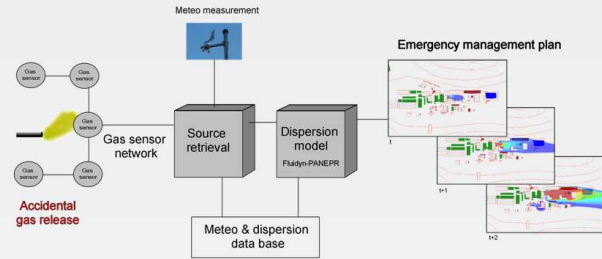


Validation of the Real-Time detection of leak source and prediction of gas dispersion on an industrial site

Real time detection and dispersion methodology

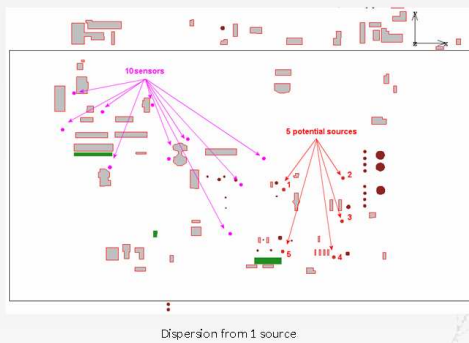
- Bayesian inference with the construction of a PDF for parameters and optimal Markov chain sampling for fast convergence

- Forward dispersion based on WF database



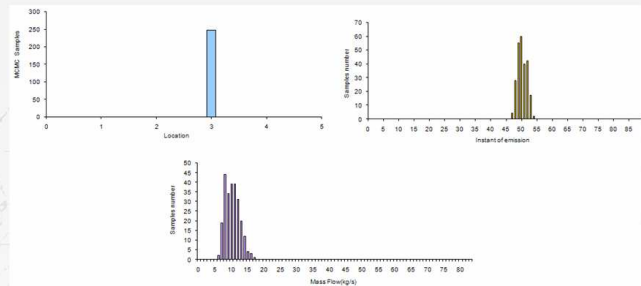
Real time detection of leak source methodology validation

From **real time collection** of data coming from site **sensors**, **source location** and **intensity** can be **retrieved**.



Probabilistic approach making use of both **real time measurements** and pre-calculated concentration responses from unitary emissions (puffs) on sensors.

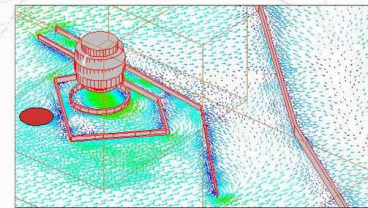
This approach is validated successfully on synthetic data using a limited number of sensors and sources on a complex site.



Results obtained after Bayesian Inference process based on unit dispersion database

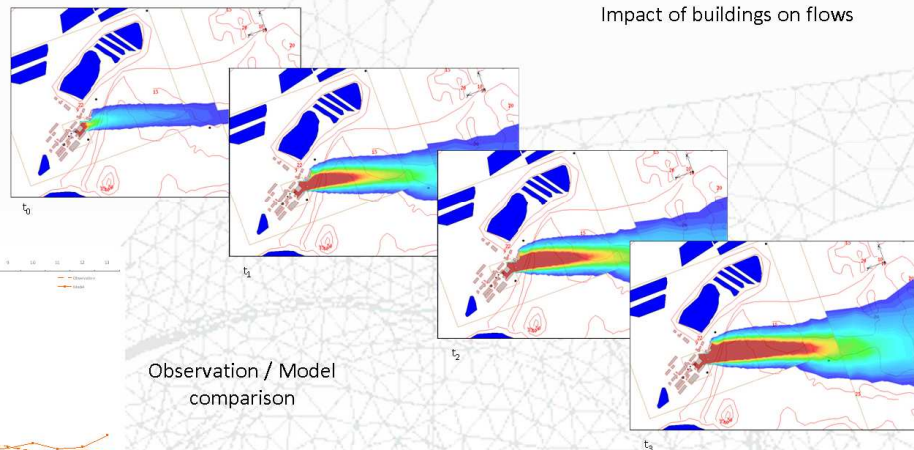
Prediction of gas dispersion on industrial site

3D CFD dispersion takes into account **impact of obstacles** of industrial site (buildings, process facilities...) on cloud behavior. Use of **lagrangian puff model** allows to accelerate calculation and to follow **direct dispersion in real time**.



Impact of buildings on flows

Real time dispersion monitoring



Observation / Model comparison

