www.omniscientis.eu

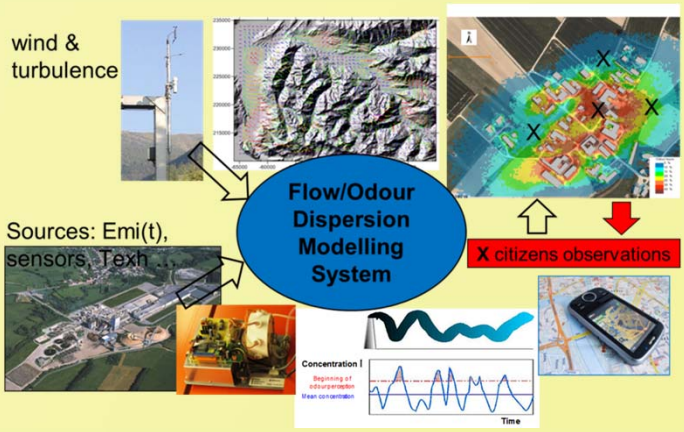
Funded by the European Community's 7th Framework Programme FP7/2007-2013 under grant agreement no. 308427 "OMNISCIENTIS"

ADVANCED ODOUR DISPERSION MODELLING IN A NEW ENVIRONMENTAL INFORMATION SYSTEM

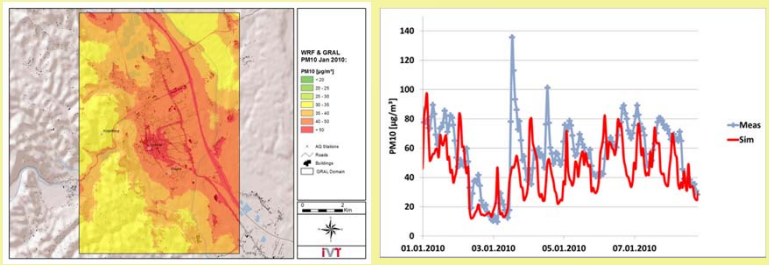
U. Uhrner[1], G. Grosso[1], D. Öttl[2]

[1]Institute for Internal Combustion Engines and Thermodynamics, Graz University of Technology, 8010 Graz Austria; [2]Dep. 15 Housing, Energy and Engineering, Provincial Government Styria, 8010 Graz, Austria

OMNISCIENTIS brings together state of the art technologies and open communication capabilities in order to mitigate odour annoyance. An information system is being developed allowing citizens to act as human sensors indicating odour perception, discomfort and nuisance, through a dedicated tool on odour acceptability based on a community-based opinion. Innovative in-situ sensors are also used to monitor ambient odour exposures and a specific odour dispersion model is developed to obtain interrelated spatial odour exposure levels due to the release by the sources. OMNISCIENTIS system will be tested in two pilot case studies in Belgium and Austria.



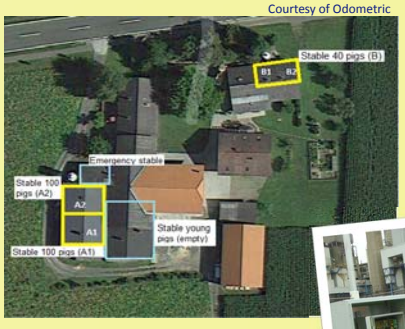
Validation with air quality measurements: PM10 Simulation in Leibnitz PMinter



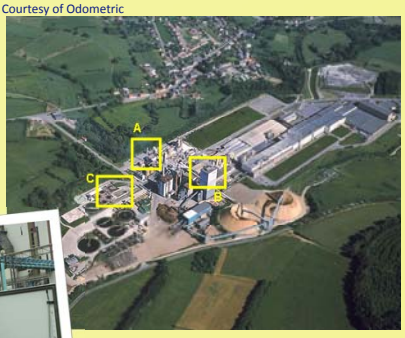
Pilot Cases

Pig farm
- Sparsely populated region
- Flat terrain
- Odour sources:
  - Well defined (stacks, forced ventilation)
  - 1 small diffusive source
  - Farm management known
- Dispersion model testing

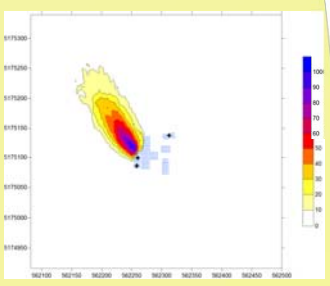
Courtesy of Odometric



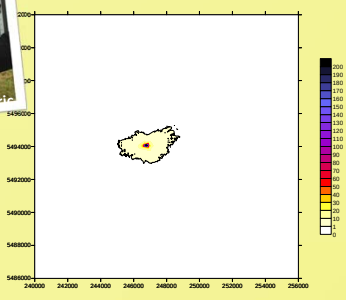
Courtesy of Odometric

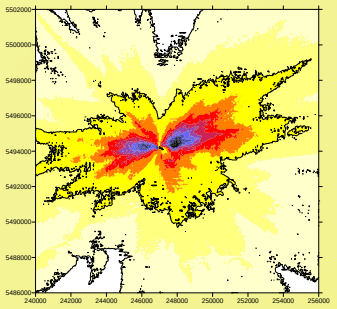


Pulp and paper mill
- Populated pilot region
- Hilly terrain
- Odour sources :
  - Complex (6 main sources, time fluctuations)
  - 1 main diffusive sources
- Involved citizens, living lab testing



Odour + passive tracer dispersion simulation and measurements





Area source and point source odour dispersion

Expected Benefits

- In-situ sensors + modelling: link between sources and citizen's perception, (spatial and temporal evolution of odour dispersion)
- Integrated environmental management involving all stakeholders
  - Citizens as human sensors (geo-mobile application)
  - Powerful tool for authorities (information quickly available + forecasting)
  - Reduce conflicts
  - Improve citizens life quality

First results:

- Good performances of the new model system for air pollution simulations
- Promising results of first odour dispersion simulations
- Real time modelling on GPUs (KTT-iMA)

Contact

Dr Ulrich Uhrner, Dr Giovanna Grosso
IVT- TU Graz, Austria
uhrner@ivt.tugraz.at
grosso@ivt.tugraz.at
☎+43-316 873 30 220