Novel Tool for Urban Air Quality Monitoring – AIRQ

Goal of the project:
The aim of the project is to parameterise some particular mechanisms of turbulent mass and momentum transfer that are likely to happen in specific urban forms named hereafter street-half-canyon. Another goal is to introduce that parameterisation in an existing air quality model used for regulatory purpose in France, SIRANE, so as to make this code able to address the question of industrial emissions in densely populated located directly around city centres, together with the validation of the new version of SIRANE with real life data provided by measurements taken in an urban environment submitted to industrial emissions. And also to install SIRANE in the city of Timisoara for air quality monitoring.

Short description of the project:
The team in Romania provides the data required for running the software and perform measurements for validation of the calculated data. Expected results include an environmental cadastre of emissions, including anthropogenic and natural pollution sources. Three dimensional maps of pollutant species concentrations would be available as a result of the research developed in this project. The new version of SIRANE developed during the project would allow decision factors to identify the most likely reason for exceeding imposed limits. Also, based on the results provided by this new tool, a better urban planning would be possible, so that a higher air quality can be ensured.

Project implemented by:
The department for Mechanic Machines, Equipment and Transportation from Politehnica University of Timisoara in partnership with Ecole Centrale de Lyon from France.

Main activities:
• parameterization of turbulent mechanisms responsible for pollution dispersion in specific urban forms;
•implementation of that parameterization in an existing urban air quality model;
•validation of the entire modeling chain by measurements in the city of Timisoara;
•quantification of uncertainty in the results resulting from the quality of the emission cadastre;
•development of a warning system that identifies episodes of exceeding imposed concentrations limits;
•development of improved urban planning strategies.

Results: a new dispersion model, new air quality monitoring tool for urban air quality, database containing pollutants concentrations.

Research team:
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"Our most basic common link is that we all inhabit this planet. We all breathe the same air."
John F. Kennedy