H13-111
FIRST STEPS TOWARD AN AIR QUALITY FORECAST IN THE ISTANBUL AREA USING HARMONIE
G.Geertsema, H.Toros, G.Cats, S.Incecik

Air quality levels in the urban area of Istanbul are a serious issue. Chemical weather forecasts of high quality will be highly valuable. To investigate the possibilities of an operational air pollution forecast system a collaboration between KNMI and the Istanbul Technical University (ITU) is started. In this collaboration the possibilities of the successor of Hirlam, named Harmonie will be investigated. In particular Harmonie will be run with a chemical module. In this talk the first results will be discussed.

Examples of air quality levels in Istanbul are shown using measurements from an urban station along a busy traffic road in the European part of the city. Interesting episodic events are selected as case studies in the framework of the project HIST09. First results of model output compared to measurements are discussed.

H13-196
MICROSACLE CFD MODEL FOR ATMOSPHERIC FLOWS AND PERFORMANCE ANALYSIS OF AIR TREATMENT WITH ROADS AND WALL SURFACE COATING
Claude Souprayen, Amita Tripathi, Guillaume Vaton, Pascal Rousseau, Ivan Drouadaine, Michel Maze

In urban areas, the pollution due to traffic and more specifically to nitrogen oxides (NOx family) is problematic. An innovative process NOXer® to reduce the level of pollution has been developed by Eurovia Research Centre and now operated on various road infrastructures. It consists in a surface coating on roads pavements and sound barrier providing a photocatalytic capture process for the NOx gas fluxes coming into contact. The most relevant set-up for the process are locations where congested traffic occurs or unfavourable dispersion mechanisms are produced (complex geometry and/or the weak atmospheric flows).

From laboratory data with controlled experiments (for the geometry chamber, fluxes, concentrations, UV light power...etc), the abatement curves and dependencies have been built. The transposition to, and performance analysis of a real configuration had to be studied with the application of microscale modelling with computational fluid dynamics (CFD). The selected real case and project infrastructure is a large and complex 3D area on a motorway with a tollgate in a trench surrounded by elevated buildings and between tunnel portals. This most critical situation shows congestion and high traffic, coupled with weak canyon winds. In a dedicated software fluidyn-PANROAD, several simulations of typical scenarios have been produced. Important features as captured by the simulations are related to the atmospheric turbulent boundary layer (for background inlet flows), to 3D geometrically perturbed flows, localized and distributed sources from vehicles exhausts, momentum related to vehicle motions and of course the specific physical and numerical models for sink term of NOx pollutant on the coated surfaces. The steps and hypothesis related to the numerical set-up and scenarios will be described. The main simulated flow patterns and more specifically the flows on the lowermost boundaries for surface contact analysis will be depicted and discussed. Finally the performance analysis of the pollution reduction (and vertical structure) will be provided from simulations with vs without NOXer® activation. Global budgets and remarks on the 3D explicit quantification with CFD modelling are concluding the work.

H13-239
TRAFFIC EMISSION AND MICRO SCALE DISPERSION MODELING IN SANTIAGO DE CHILE
Martin Nogalski, Johannes Werhahn, Ulrich Uhrner

Within the project “Risk-Habitat-Megacity” air quality modeling was performed on the meso and the urban micro scale (10 m x 10 m). Due to the relevance of traffic emissions to the overall air quality situation in Santiago de Chile emphasis was laid on the traffic. Based on traffic counts and traffic modeling work for the road network of Santiago (done by local partners), traffic emissions have been calculated and allocated to the respective road sections. These detailed results were used for micro scale modeling and are the basis for an updated emission inventory for meso scale modeling. The base case (present situation) and model validation are the starting point for the calculation of future scenarios. The development of future scenarios is one of the most important features of the project due to the integrated sustainable urban development approach in Santiago de Chile. Based on the outcome of the traffic model ESTRAUS first results will be presented from the emission model MODEM and the dispersion model GRAL. Hot spot regions of the city will be identified and the scenarios will be discussed.

H13-240
EFFECT OF DEFORESTATION ON DISPERSION IN STREET CANYONS BY KATABATIC WIND
Zhiwen Luo and Yuguo Li

Katabatic wind is a predominant ventilation source for the urban settlements located in the mountain regions, especially when the synoptic wind is absent and the sky is cloudless. However, the interaction between the katabatic wind system with the urban street canyons were little addressed in the literature. To fill this gap, CFD simulations were conducted to study the