provided for the Directive 2008/50/CE. Several European modelling studies show the modelling behaviour on simulating particulate matter, many of them focused their attention on Pianura Padana region, which is the most populated and industrialized area in Italy. All of them analyzed particulate matter horizontal distribution comparing modelling results with ground-based observations. In our study we focused our attention in the validation of modeled vertical profile of the particulate matter (PM) as, its good representation in space and compositions is an important step for public health related studies and besides it could get to be an important useful instrument in the retrieval of the aerosol concentration from the lidar signal. The aim of this study is a first evaluation of an air quality modelling system at 1 km resolution with detailed urban landuse in the simulation of the vertical structure of the aerosol layer in the polluted area of Milan (Bicocca site). In order to achieve our objective we compare model results with Ballon-borne and continuous lidar measurements collected during two intensive campaigns in the frame of the ASI/QUITSAT project.

**H13-197**

**COMPLEX WIND AND TURBULENCE FIELDS MODELLING USING CFD IN COMPARISON TO BOLUND BENCHMARK CASES**

_Lobnat AIT HAMOU, Claude SOUPRAYEN, Sharad TRIPATHI_

Today, a large number of wind farms are erected in complex terrain with the hope of a large energy production. By placing wind turbines in hilly terrain, along ridges and even in mountainous areas, wind phenomena like flow separation and recirculation can, however, greatly increase the structural loads on the wind turbines. Reliable predictions of such wind features are therefore important for siting of wind turbines in complex terrain and is the subject of the Bolund experiment. The Bolund hill is a 12 m high peninsula located at Roskilde Fjord 1 km north of Risø/U near the city of Roskilde (Denmark). Bolund was selected for a field experiment because of the need for experimental data for validating models of flow in complex terrain. An increasing number of wind farms are being installed in complex terrain, but the tools often used to predict the wind flow have been developed for simple terrain and have not been properly validated against complex terrain experiments at atmospheric scale. The Bolund dataset allows for such a validation. From the accuracy of the flows simulation depends the correct estimation of the flow near obstacles and slopes. Simulations through CFD approach provide the accuracy expected by taking into account all the 3D elements influences.

For this comparison, Fluidyn uses the fluidyn-PANACHE numerical tool, a self-contained fully 3-D fluid dynamics, taking into account all topographical and meteorological parameter in a high precision numerical scheme. Parameters considered for the 3D dispersion model are altitude curves, building heights, windrose data (velocity, direction and Pasquill class), ambient air temperature. For increasing precision of results, an outer domain and a nested domain were used in the problem with unstructured meshes. Intricacy and type of the mesh used, computational scheme and turbulence model were the parameters governing the precision of the results. The results were compared in terms of accuracy and computational complexity.

**H13-204**

**VALIDATION OF ATMOSPHERIC CHEMISTRY/AEROSOL MODEL COUPLED TO REGIONAL CLIMATE MODEL IN HIGH RESOLUTION**

_Tomas Halenka, Peter Huszar, Michal Belda_

Recent studies show considerable effect of atmospheric chemistry and aerosols on climate on regional and local scale. For the purpose of qualifying and quantifying the magnitude of climate forcing due to atmospheric chemistry/aerosols on regional scale, the coupled regional climate model and chemistry/aerosol model has been used recently on the Department of Meteorology and Environmental Protection, Faculty of Mathematics and Physics, Charles University in Prague, for the EC 6FP Project QUANTIFY and for EC 6FP Project CECILIA, finally for EC FP7 Project MEGAPOLI, where benefits from high resolution are applied in research aiming to study the impact of big cities on climate and vice versa. For this couple, existing regional climate model and chemistry transport model are used. Climate is calculated using model RegCM while chemistry is solved by model CAMx. Meteorological fields generated by RCM drive CAMx transport, chemistry and a dry/wet deposition. A preprocessor utility was developed for transforming RegCM provided fields to CAMx input fields and format. The validation results as well as the discussion of the impact of both-way coupling when interactive modification of radiative transfer due to atmospheric chemistry/aerosols is taken into account are presented. The sensitivity to the inclusion of specific parameterization and emissions of urban areas is studied as well.

**H13-226**

**DEVELOPMENT AND APPLICATION OF A QUANTITATIVE INDEX OF STEADY-STATE CONDITIONS**

_Joseph S. Scire_

The selection of an appropriate modelling technique is an important consideration in determining the quality and reliability of air quality model predictions. An important consideration is the consistency of model assumptions such as those in steady-state plume models with actual conditions.