This research is undertaken in the framework of new legislation for industrial noise with an emphasis on noise from windmills. The results of this research are also applicable to air pollution and dispersion applications since the winds in the boundary layer are amongst the most relevant meteorological parameters influencing the concentration of pollutants.

**H13-125**  
**EVALUATING AERSURFACE ROUGHNESS ESTIMATES FOR USE IN EPA’S AERMOD DISPERSION MODEL**  
Roger Brode

AERMOD has recently become the preferred air dispersion model for near-field regulatory applications in EPA’s \"Guideline on Air Quality Models,\" replacing the ISCST3 air dispersion model. Unlike ISCST3, the AERMOD modeling system requires the input of three surface characteristics, albedo, Bowen ratio, and surface roughness, which are used in processing meteorological data for input to AERMOD. EPA recently completed development of the AERSURFACE tool, which is designed to assist users with determining these surface characteristics based on gridded land cover data. The current version of AERSURFACE was released in January 2008 and supports the use of 1992 National Land Cover Data (NLCD92), available from the U. S. Geological Survey (USGS) at a 30 meter horizontal resolution for the continental U. S. While AERSURFACE provides a more objective technique for determining surface characteristics, the NLCD92 land cover categories are not ideal for purposes of estimating surface roughness at airport locations. The newer 2001 NLCD data provides some advantages over NLCD92 data, but the 2001 land cover categories present additional challenges for estimating roughness at airports. EPA has recently begun evaluating AERSURFACE roughness estimates at airport locations using 1-minute ASOS wind data with a gust factor method based on Wieringa (BAMS, 1980). This presentation will include preliminary results from the evaluation of AERSURFACE roughness estimates, and will describe EPA’s current plans for enhancing the AERSURFACE tool.

**H13-142**  
**INFLUENCE OF TRAFFIC EMISSIONS VARIABILITY ON AIR QUALITY PREDICTIONS**  
Tchepel O., Monteiro A., Ferreira J., Dias D., Miranda A.I., Borrego C.

Application of air pollution models is always confronted with uncertainties and their quantification is crucial, especially when the models are used for regulatory decisions. One of the important sources of uncertainty in the air quality modelling is atmospheric emissions. Besides the errors related with measurements and incompleteness of the data used in the inventories, emission and activity factors are characterised by heterogeneity of values with respect to time and space. This natural variability is critically important in the emission uncertainty analysis. However, current emission inventories contain none or limited information regarding the uncertainties.

The prime objective of the current work is the analysis of uncertainties in the predictions of a chemical-transport model due to the uncertainties in input emission data using a probabilistic approach. The methodology is based on the Monte Carlo technique which consists in multiple selections of random values of emission factors and activity data, within their individual probability density functions, and following calculation of the corresponding emission values. The air pollution modelling system is run repeatedly using these multiple emission inputs. An ensemble of deterministic simulations is used to create probabilistic estimates of air pollution and the probability density function (PDF) for predicted concentrations is analysed.

The methodology was applied to the North Region of Portugal. The road traffic emissions were quantified by the Transport Emission Model for Line Sources (TREM) adapted to be used in combination with the Monte Carlo application. Vehicle hourly flows were obtained from automatic counting system considering complex road network as line sources. The MM5-CHIMERE modelling system was applied using the multiple runs and thus providing a random sample of 50 values for concentration predictions at each grid cell. The model outputs are analysed in terms of 95% confidence interval. It is concluded that variability in emission data has important contribution on air quality predictions especially in urban areas where highest uncertainty for the road traffic emissions was obtained.

**H13-171**  
**MODELLING ANALYSIS OF PARTICULATE MATTER VERTICAL DISTRIBUTION AND COMPOSITION IN MILAN URBAN AREA**  

The air quality on the regional and local scale and in particular suspended particles are of great interest for the society, because it affect human health, forest and other ecosystem and moreover, particles act on climate change by affecting the Earth’s radiative balance, directly by altering the scattering properties of the atmosphere, and indirectly by changing clouds properties. In recent years for the study of air quality and in order to have information on aerosol physical features, several particulate matter data was collected in different kind of sites. However, surface measurements are not sufficient to fully understand the pollutants dynamics and chemistry. For better understand how pollutants evolve and to have answers about the processes which causes pollution events, the scientist have been made important efforts to improve three dimensional air quality models which are to day important instruments for monitoring, planning and analysis of atmospheric environment as