*Forecasting the weather
- ensemble techniques
in probabilistic weather prediction*

Analyses and Forecasting of Urban PM10 Air Pollution Episode in Very Stable Conditions in Istanbul, Turkey on 6-9 November 2010

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The causes of air pollution episodes in urban areas are complex and depend on various factors including local emissions, meteorological variables and topographical conditions. Istanbul is the largest city of Turkey, with a population well over 13 million people. Particulate Matter episodes have been in winter and spring/fall seasons in some locations of Istanbul. The higher concentrations occur in winter mostly with the effect of residential heating in the city due to the some of the coal using residents. The ratio of the days with daily PM10 concentrations exceeding the limit value of 50 μgm-3 in the monitoring stations of urban area is varied in between 23-60 % of the stations in winter season (Celebi et al., 2010). The local emission sources may have been responsible for daily mean concentrations > 50 μgm-3 at several ratios of the monitoring sites each year. Furthermore, a new air quality station in Kagıthane region is located at the valley of Golden Horn harbor has experienced the higher PM10 concentrations along the year in the region. The region is exposed to the many industrial facilities and busy urban traffic in this creek valley. Valley topography and industrial and traffic emissions may lead to significant episodic conditions of PM10 in the region. These conditions result in high PM10 concentrations higher than 300μg/m3 hourly, sometimes reaching 570μg/m3 occur mainly in some locations of Istanbul during the strong episode.

In this study an analysis and evaluation of the air pollution episode on 6-9 November 2010 was presented. We carried out simulations with the Weather Research and Forecasting-Chemistry model (WRF-Chem) v3.3 to produce PM10 forecasts during the episode in Istanbul. WRF-ARW is run with two-way nesting option for domains with 18 km, 6 km and 2 km resolutions and 44 vertical levels. The episode was associated with the influence of high pressure having with warm core over Istanbul and surrounding areas. It is also leaded to low wind speed and strong inversions throughout the episode period near the ground level.