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Trends in Surface Ozone Concentrations at Bucharest, Romania from 2005 to 2007

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Data from six urban sites in Bucharest, Romania are analyzed to investigate the surface ozone concentrations, seasonal changes and long-term trends. The monitoring sites are in EPA (Environmental Protection Agency) network of Bucharest and analyzed period is from 2005 to 2007. The results have shown the highest values of ozone concentrations in summer, in weekend and in the afternoon of the day. In 2005 the ozone concentration values were larger than in 2006 and 2007. In 2005 year the O_3 has had largest values starting with February. The values decrease from August to December. The smallest values are in December and January in all the three years. In general, ozone concentrations in Bucharest are found to have a negative trend at all sites for this period. Monthly mean concentrations for all the three years have shown a clear pattern with maximum values during spring or early summer and minimum in winter.

The seasonal variation was the net result of a number of processes such as dry deposition, photochemical loss (titration with NO_x) and formation, and varying precursor concentrations of the ozone.

In addition to the seasonal variation, ozone concentrations have presented a variation on a shorter time scale. The diurnal variation was also a result of the variation in vertical mixing, surface dry deposition and photochemistry. Thus, traffic sites generally have shown the pronounced diurnal cycles in spring and summer. In general, the lowest concentrations are found in early morning and the highest in the afternoon. Back trajectories analysis estimated by the HYSPLIT model was used for understanding how short-term variability in surface ozone depends on transport into Bucharest. Concentrations were highest for air masses characterized by dry, warm conditions. We combined air mass characteristics and trajectories approaches to provide a useful characterization of air quality conditions.