



Studying the influence of meteorological conditions on air quality at Ukrainian urban and background monitoring sites

V. Godunova (1), O. Perekhod (2), Ya. Romanyuk (2), V. Lapchenko (3), and M. Sosonkin (2)

(1) ICAMER Observatory, National Academy of Sciences, Kiev, Ukraine (godunova@mao.kiev.ua / Fax: 38044 526 21 47 / Phone: 38044 526 47 69), (2) Main Astronomical Observatory, National Academy of Sciences, Kiev, Ukraine, (3) Kara-Dag Natural Reserve, the Crimea, Ukraine

The analysis of ozone mixing ratios measured at urban and rural sites in Ukraine was focused on investigation of diurnal and seasonal variability of ground-level ozone, as well as on studying the influence of meteorological variables on ozone concentration, especially on urban scale. Along with various parameters, the numbers of ozone threshold exceedances in 2007-2008 in Kiev were calculated. The present results show that meteorological processes are most important for the interpretation of ozone variability on urban scale during the warm months of the year. For instance, a close correlation was found between ozone concentration and maximal diurnal temperature, i.e. influence of mean diurnal temperature on ozone in the Kiev suburbs appears to be less important. Furthermore, it was found that the second important factor, which influences on ozone concentration, is its concentration on the day before.

We also measured ozone along with carbon monoxide and meteorological variables at the Terskol Observatory at an elevation of 3125 m asl, in the North Caucasus. Carbon monoxide plays an important role in the ability of the atmosphere for self-cleansing; its role in ozone formation is larger in the background troposphere than in urban areas. The carbon monoxide measurement started at Terskol for the first time in autumn 2007. Local emissions are low and rare there; thus, this site can be classified as a background station. The mean concentrations of carbon monoxide in the ambient air at Terskol are found to be roughly 140 ppb in winter and 100 ppb in summer; the seasonal variations are characterized by a minimum during the summer and a broader maximum from January to April that is similar to the observations at other mountain stations, for instance, at Jungfraujoch (Switzerland, 3580 m asl). In the paper, we present results of the continuing analysis of the data obtained.