

The Background Ozone Concentration Trends in the Surface Layer over Hungary

V. Debreczeni (1), L. Haszpra (2), R. Mészáros (1), I. Lagzi (1)

(1) Department of Meteorology Eötvös Loránd University, Hungary
(viki.debreczeni@gmail.com, Fax:36-1-3722904), (2) Hungarian Meteorological Service

The enormous increase of industrial and agricultural activities as well as the advent of motorized vehicular traffic during recent century, have resulted in a sharp rise in the emissions of many primary air pollutants, such as NO_x, VOCs, and CO. One of the effects of these anthropogenic emissions has been an increase of ozone concentrations, most notably over Europe. To abate the rise in concentration of ozone precursors, international agreements were negotiated. However, lack of full and universal compliance has delayed the hoped-for reversal in ozone concentration trends. A definitive and detailed evaluation of measured ozone concentrations has never been evaluated for Hungary. Thus, the goal of this study is to process and analyze the 16-year long hourly data from K-pusztá regional background air pollution (EMEP) monitoring station. Hourly, daily, and monthly averages, maximum and minimum values, as well as the amplitude of daily and annual variations in ozone concentrations have been analyzed. Measured data have been compared with Hungarian and European standards based on criteria of human and ecological health. The Péczely's macrosynoptic categorizations were used for the description of the regional scale of surface level ozone concentrations over Hungary; investigation of the Lagrangian trajectories was performed using K-pusztá data for high (>60 ppb and >80 ppb) ozone concentration situations. Based on results it seems that despite international agreements, decreases in tropospheric ozone levels have not yet manifested in K-pusztá data. Furthermore, these levels frequently exceed the limits set by standards. The limit-exceeding ozone concentration peaks often occur when there is an anticyclone over the Carpathian basin. Results of trajectory analyses are also presented here.