



Ozone variability over Ankara, Turkey

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The amount of ozone at any location depends on variations on all of time scales. The ozone distributions vary with latitude, with different seasonal cycles at different locations. Such variations arise because of the overall ozone circulation patterns. In the mid-latitudes, ozone in the upper stratosphere has a regular seasonal variation. The systematic seasonal variation is due to the general circulation in the stratosphere. The daily variation is related to the atmospheric conditions. Ozone variability in the lower stratosphere is more dependent on transport processes than on photochemical processes. Over mid-latitudes strong variability in total ozone occurs by meteorological variability.

The present study deals with the variability in the total column ozone over Ankara (39°55'N; 32°55'E) which is located at the center of Anatolia. Statistical trend analyses have been performed for monthly average total column ozone data from TOMS instruments over the period 1978-2006. The linear regression technique was applied to the TOMS data to study the trends during 1978-2006. In these analysis, in order to understand the effects of various dynamical and circulation variations, Arctic Oscillation, Quasi-biennial Oscillation and Solar Cycle are examined.

A seasonal variation the total column ozone presents maximum ozone in the spring and minimum ozone in the fall. The highest total ozone (361.1 DU) is in March and the lowest (284.9 DU) in October resulting in variability about 76 DU. The results agree with the zonal averaged data at 30°-50°N the seasonal cycle which ranges 80 DU from maximum to minimum. In addition, the second highest ozone (357.8 DU)

is found in April, and the second lowest (290.7 DU) in November over Ankara. The ozone decreases in all seasons. The rate of decrease is -2.7 % per decade in Ankara. The maximum decrease is found in winter (DJF) and the minimum in fall season (SON). The total ozone over Ankara decreases from the early spring (March) to the late fall (November) and increases during winter.

Additionally, in order to measure total column ozone at Ankara Brewer MK III instrument has been installed on the roof of Turkish State Meteorological Service (TSMS). The Brewer MK III has been in operation since October 2006. Being the only Brewer in Turkey, it forms an integral part of the WMO ozone monitoring network.

The preliminary Brewer measurements (November and December 2006) in Ankara were also compared with the TOMS ozone column data.

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