



## **Tropospheric ozone climatology at extratropical latitudes**

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Tropospheric ozone climatology at extratropical latitudes is analyzed based on surface ozone and ozonesonde measurements over the target period 1970-2001. The climatology gives monthly mean ozone ratios in troposphere as well as corresponding interannual standard deviations in extratropical latitudes (90 oS - 30 oS, 30 oN - 80 oN) with one kilometer vertical resolution for the most important ozonesonde stations (ca. 25 stations) which have observation for more than 10 years.

Seasonality of ozone concentration is observed in the troposphere at all levels. At the fixed altitudes of the upper troposphere of the Northern hemispheric extratropical latitudes seasonal maximum is observed at the end of spring - beginning of summer which is 1-3 months earlier than seasonal maximum of the tropopause height. Seasonal ozone cycle in the Southern hemisphere is more complicated as a result of Antarctic ozone anomaly (hole). With an altitude decrease time of the seasonal maximum shifts to the spring - winter. Seasonal variations of the surface ozone concentration are estimated in dependence on the time of the day for the sites of both hemispheres. A substantial difference is observed between seasonality of the surface ozone concentration at different hours, i.e. seasonal maximum of daytime ozone occur 1-3 months later than the one of the night-time ozone. Seasonal cycle of the daily mean and daily maximal ozone in both hemispheres is characterized by single or double maximum during the winter - summer. At polar latitudes seasonal maximum of the surface ozone concentration occurs in the winter - spring and while moving to the equator the time of maximum either shifts to the summer months or second summer maximum is formed. We suppose that spring ozone maximum is connected with seasonal features of temperature dis-

tribution while the summer one is connected with a photo-chemical ozone generation which is confirmed by a secondary maximum absence in non-polluted regions.

Analysis of the surface and free tropospheric ozone seasonality let us conclude that time of the seasonal maximum formation near the Earths surface is connected in substantial degree with an ability of the surface and the atmospheric boundary layer to contribute to the ozone destruction.

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