

SURFACE OZONE IN MOSCOW ENVIRONS: 1991-2000

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Regular surface ozone measurements at Dolgoprudny (green-belt zone 25 km north of Moscow centre) have been conducted since February 1991. Surface ozone is seen to change from 0-1 ppb (that was typical of cold and misty weather) to 108 ppb. The seasonal night-time surface ozone maximum is observed when column ozone is also at maximum (March-April); its day-time maximum occurs almost two months later, close to the period of seasonal temperature maximum (May-June). The time series of surface ozone residuals (differences between actual values and "norms") can be described by the sum of the linear regression of a series of meteorological residuals and the autoregression of that of ozone. The most important meteorological parameters are day-time temperature, day-night temperature difference, vertical temperature gradient and daily relative humidity. Usually, quite satisfactory surface ozone forecasting for the next day can be described by a regressive sum of forecasted deviations of temperature and relative humidity. Surface ozone underestimation occurs during summer adverse weather conditions that prevent air clearing and enhance pollution over the major part of the city with high concentrations of pollutants. Most surface ozone characteristics at Dolgoprudny are similar to those observed at rural stations in Western Europe, with some special features also detected, e.g., surface ozone at Dolgoprudny is lower and summer/winter and day/night ratios are larger. Sometimes, surface ozone series are indicative of direct stratosphere-troposphere intrusions. Rare (not in every year) episodes of extremely high ozone (70-105 ppb) in June-September seem to be related with photochemical processes similar to those observed in Los-Angeles smog.