STATISTICAL MODELLING OF OZONES MEASUREMENTS: MONTHLY MEANS OR DAILY MEANS?

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Long-term ozone trends are commonly determined by multiple regression models based on monthly mean values. Quasi-biennial oscillation (QBO) and the 11-year solar cycle are used to describe the natural variability. Further explanatory variables (such as tropopause pressure or North Atlantic Oscillation) have been used for the description of the influence of dynamical changes on ozone trends. However, the dependence between ozone and several explanatory variables (e.g. tropopause pressure) might depend on the temporal scale (e.g daily values versus monthly means). Furthermore, the measurements are performed on individual days (i.e. as single points in time) which do not represent continuous values. In our contribution we address this problem by comparison of the results of multiple regression analyses of daily and monthly values. The study is based on total ozone measurements of 65 northern hemispheric stations and a variety of explanatory values (including temperatures, troposphere pressure (or height) Arctic Oscillation and other climate indices.