



Ozone trends related to its explanatory parameters at Observatoire de Haute Provence (OHP) from 1985 to 2004

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The deseasonalized time series of stratospheric ozone profiles by different measurements (Lidar, Umkehr and SAGE II) and of total ozone by TOMS at Observatoire de Haute Provence (OHP), are analyzed to investigate the relationship with explanatory parameters and to derive their trends. A multi-linear regression model was applied to the time series with the Quasi-Biennial Oscillation, solar cycle, North Atlantic Oscillation, Eliassen-Palm flux, tropopause pressure, Equivalent Effective Stratospheric Chlorine, aerosol and teleconnection patterns (East Atlantic Oscillation, EU-blocking pattern and Scandinavian pattern) as explanatory parameter. The analysis of total ozone showed that QBO, EP-flux, EESC and tropopause pressure are the main forcings explaining the variability of the time series. However, the influence of these parameters varies depending on the month. Multi-linear regression including all the parameters explained over 80% of monthly total ozone variation from January to May. The trends of total ozone are $-3.4\%/decade$ and $-2.9\%/decade$ for the periods 1978-1997 and 1978-2002 respectively. As for the ozone profile, the degree of explanation of parameters varies depending on altitude as well as measurement method. Discrepancies between the time series obtained by the various instruments are analyzed. 35% to 82% of variation for Jan. and Feb. at ~ 40 km are explained by the parameters. This study is supported by the CANDIDOZ project of the European Commission (Chemical and Dynamical Influences on Decadal Ozone Change).