

Name of research institute or organization:

**Climate and Background Ozone, Physical Geography,
University of Bern, Switzerland**

Title of project:

Tropospheric Ozone and Precursors – Data Quality Control, Trends, and Seasonal Cycles

Project leader and team:

Dr. Evi Schüpbach, Project Leader

Team: Dr. Prodromos Zanis, René Kernen

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Project description:

Data quality control, trends and changes in the seasonal cycle. In climatological time series, data quality control is important if trends want to be estimated. Homogeneity tests have traditionally been developed for meteorological time series; serial correlations are, however, stronger in tropospheric ozone records, and hence the classical homogeneity tests cannot be used. We developed a *state space approach* which provides a suitable statistical methodology to simultaneously account for autocorrelation structures of the regression residual, changing seasonal components, and stochastic trend components. Application of this state space methodology to Jungfraujoch surface ozone data (1988-97) reveals that statistically significant decreases in the estimated seasonal components for May ozone concentrations have occurred at Jungfraujoch over the last decade. It is believed that this decrease is due to chemical changes in the background atmosphere over continental Europe.

Key words

tropospheric ozone, data quality control, trends, seasonal cycles, spring ozone maximum

Collaborating partners/networks:

EU-Project TROTREP (U.K., Norway, Sweden, The Netherlands, Switzerland).

Swiss-British Collaboration on the Jungfraujoch Studies: Prof. Stuart A. Penkett (University of East Anglia, Norwich, U.K.), Dr. Paul S. Monks (University of Leicester, U.K.).

Laboratory of Atmospheric Physics, University of Thessaloniki, Greece (Dr. Prodromos Zanis).

TOR-2 (Tropospheric Ozone Research) Sub-Project in EUROTRAC-2.

Scientific publications and public outreach 2001:

Schuepbach, E., T.K. Friedli, P. Zanis, P.S. Monks, and S.A. Penkett, 2001: State space analysis of changing seasonal ozone cycles (1988-97) at Jungfraujoch (3, 580 m asl) in Switzerland. *J. Geophys. Res.*, 106 (D17), 20,413-20,427.

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