



**HAL**  
open science

## **Twenty-two years of Arctic ozone depletion observations and simulations. Is there a trend?**

Florence Goutail, Franck Lefèvre, Andrea Pazmino, Jean-Pierre Pommereau, M. Chipperfield, W. Feng, Michel van Roozendaël, P. Eriksen, K. Stebel, R. Kivi, et al.

### ► **To cite this version:**

Florence Goutail, Franck Lefèvre, Andrea Pazmino, Jean-Pierre Pommereau, M. Chipperfield, et al.. Twenty-two years of Arctic ozone depletion observations and simulations. Is there a trend?. Quadrennial Ozone Symposium 2016, Sep 2016, Edinburgh, United Kingdom. pp.QOS2016-224. insu-01369332

**HAL Id: insu-01369332**

**<https://insu.hal.science/insu-01369332>**

Submitted on 20 Sep 2016

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

### Objectives and Method

Quantification of chemical total ozone loss inside polar vortex by comparison between modeled passive ozone and measurements

**MODELS- 3D CTM**  
 REPROBUS and SLIMCAT  
 Both models use ECMWF operational analysis: 1000 - 0.01 hPa (80 km)  
 2 runs: a) Passive ozone, initialized on December 1, each winter  
 REPROBUS from ECMWF ozone operational analysis  
 SLIMCAT from the output of a long-term simulation  
 Full chemistry

**MEASUREMENTS**  
 Total ozone => SAOZ/NDACC UV-Visible network  
 Twice daily at twilight

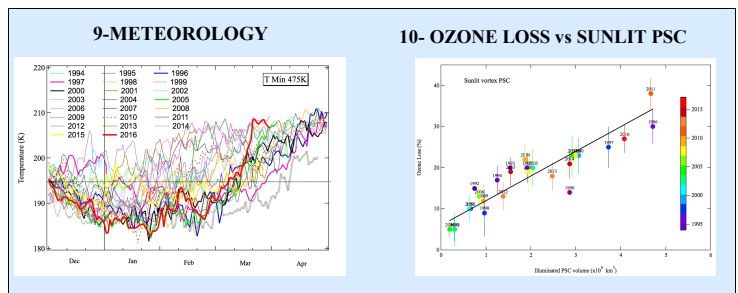
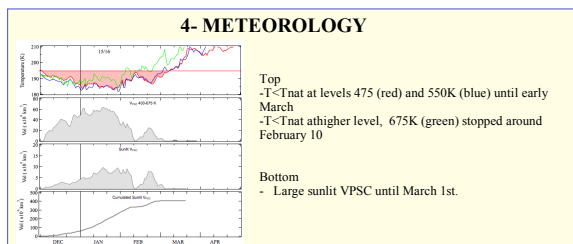
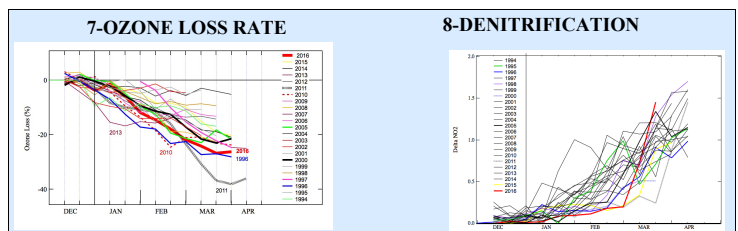
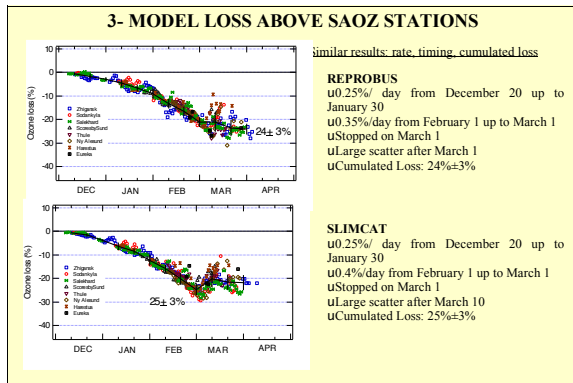
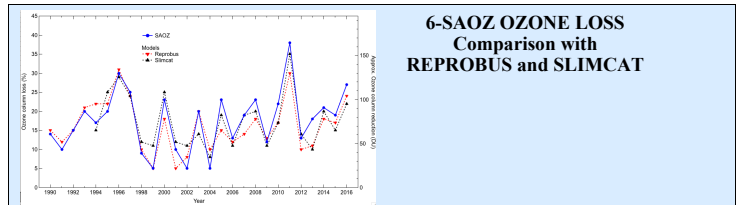
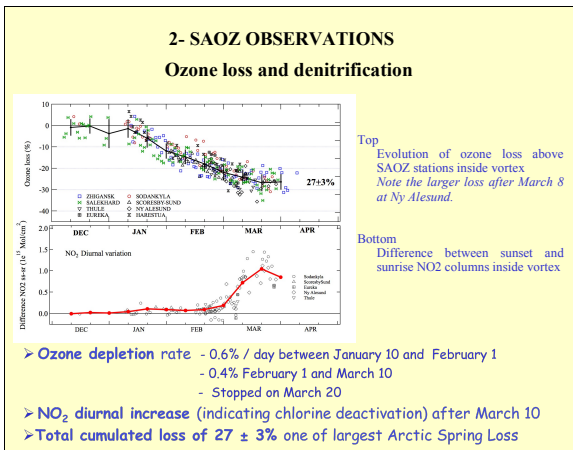
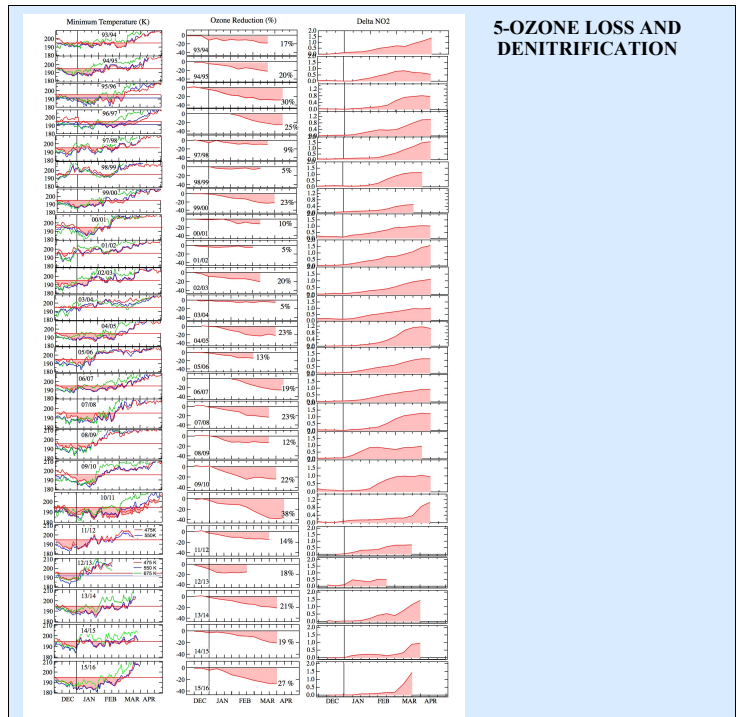
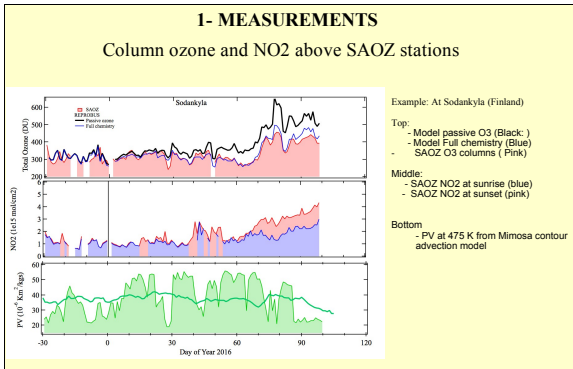
### UV-Visible SAOZ

- Zenith sky UV-visible spectrometer
- Differential Optical Absorption Spectroscopy
- Ozone: Chappuis bands (450-550 nm)
- Consistency between stations: 3% (NDACC)
- PSC days removed using a color index

### UV-Visible SAOZ network

## Winter 2016

## Comparison of all winters since 1994



### Acknowledgements

The authors thank the SAOZ stations operators and ECMWF for the meteorological analysis. This work was supported by the French CNRS and CNRS/INSU within the NDACC/OVSO. The SAOZ network is part of NDACC (Network for Detection of Atmospheric Composition Change). The authors thank gratefully Cathy Boese at French "ESPRI Data Center" (former ETHER) for providing MIMOSA and REPROBUS maps and data above SAOZ stations. The authors thank Vera Simkova and the Russian CAO/Roshydromet ozone network for providing Zhigansk and Salakhard SAOZ and Mini-SAOZ data.

### CONCLUSIONS

- Large ozone loss interannual variability, dependent on vortex duration
- Good agreement between measurements and recent version of CTM models: SLIMCAT and REPROBUS
- No indication of ozone loss amplitude reduction