

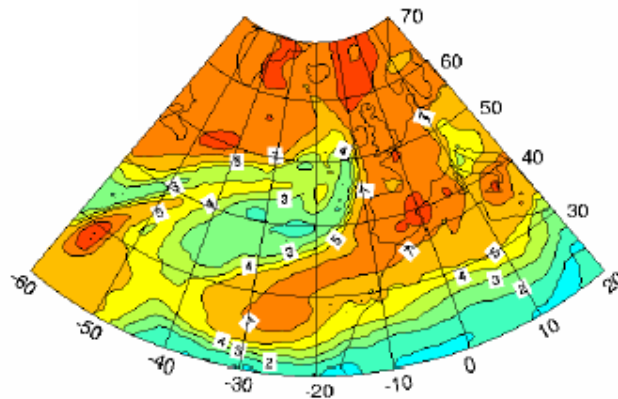
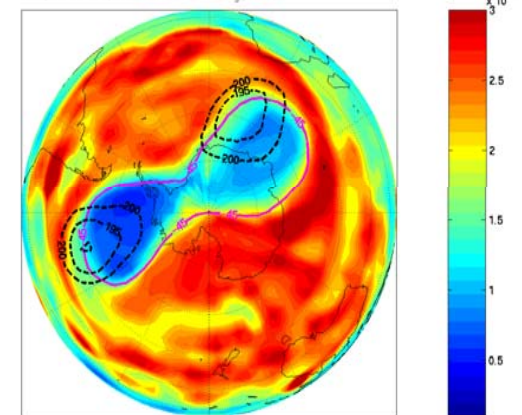
# COST 723

## Data Exploitation and Modeling for the Upper Troposphere and Lower Stratosphere



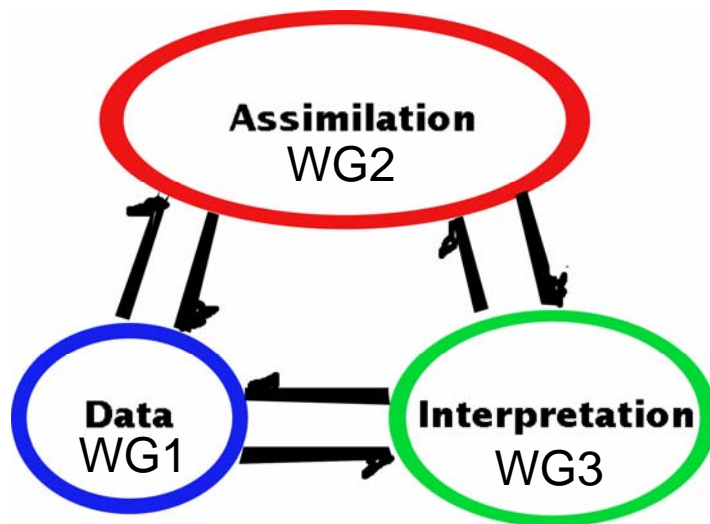
[www.cost723.org](http://www.cost723.org)

BASCOE v2b01 4D-VAR MIPAS assimilation  
Analysis for 24 sep 2002 12h00 at 475 K: O<sub>3</sub> (v.m.r.)



# Scope and Structure

- ▶ Altitude region around the tropopause is crucial for earth's energy balance (water vapor cooling below, ozone heating above).
- ▶ Chemical, microphysical, and dynamical processes not well understood .



- ▶ Model and data studies for the UTLS altitude region.
- ▶ Assimilation as the central tool to consolidate models and observations.
- ▶ 3 Workgroups for the 3 areas.

Common workshops for all workgroups.



# Countries

Belgium, Bulgaria, Cyprus, Czech Republic,  
Denmark, Finland, France, Germany, Greece,  
Italy, the Netherlands, Norway, Poland, Spain,  
Sweden, Switzerland, UK

# WG1: Data and Measurement Techniques

## Role / Goal

- Inconsistency of humidity data sets most prominent issue on global scale  
→ focus on this
- Intercomparison studies between in situ instruments and with satellite measurement. Satellites used as transfer standards.

# Activities

- ▶ Radiosonde (operational / research)
- ▶ Lidar
- ▶ Operational met. Satellites
- ▶ Envisat (MIPAS / SCIA)
- ▶ Champ
- ▶ In-service aircraft (MOZAIC)
- ▶ Microwave (uplooking / limb-looking)

# WG2: An assimilated ozone and humidity dataset

## Role / Goal

- DA used to incorporate novel observations (e.g. ozone & stratospheric water vapour in UTLS), & evaluate research satellite data (e.g. Envisat).
- Incorporate chemical data (e.g. ozone, water vapour from Envisat) into DA systems.

# Activities:

How to incorporate chemistry?

- GCM assimilation (DARC, Met Office, ECMWF; 3d-var, 4d-var)
- CTM assimilation (KNMI, BIRA-IASB, U. KÖLN, UPMC; var methods, variants of KF)
- Coupled GCM/CTM assimilation (MF; 4d-var)

Links with ASSET (<http://www.darc.nerc.ac.uk/asset>)

Envisat cal-val with GCMs and CTMs

# WG3: Assessing the state of the UTLS and understanding the relevant processes

## Tasks

- 1) *Assess the UTLS climatology*
- 2) *Assess the trends*
- 3) *Study dynamical processes in the UTLS*
- 4) *Quantify the anthropogenic effects on the UTLS*

## List of active research themes within WG3

- Ozone: assessment and variability (De Backer)
- Ozone radiosoundings (Michaelides)
- Vertical diffusivity in the UTLS (Legras)
- Cirrus clouds and supersaturation (Gierens)
- Control mechanisms of UT moisture (Smit)
- Climatology of Be isotopes, cirrus and tropopause (Zanis, Promodos)
- O<sub>3</sub> and H<sub>2</sub>O assimilation from ENVISAT (Fierli)
- STE modelling and ozone budget (Serafini)
- O<sub>3</sub> variability and trends from soundings (Cuevas)
- O<sub>3</sub> trend over Iceland. STE at northern subtropics. N<sub>2</sub>O increase (Gil)
- Gravity waves and mixing in the UTLS (Vaughan)

## Tools:

- short scientific missions (3 last years)
- dedicated workshops on hot scientific topics (cirrus meeting at DLR, Oberpfaffenhofen)
- coordination with/within SCOUT-03
- UTLS summer school

# COST 723 UTLS Summer school

26 September to 8 October 2005  
Cargese, Corsica

## Topics:

- UTLS measurement techniques
- data assimilation
- modelling studies of the UTLS

## Audience

- researchers + students (school/workshop)

## Format

- no more than 15 lecturers, 50-60 participants
- main courses + group work
- posters
- computer practice

## Cargese Institute of Scientific Studies

