

<http://www.leos.le.ac.uk/home/>

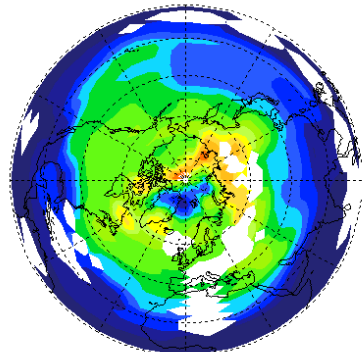


Potential science with HIRDLS

J.J. Remedios and D.P. Moore

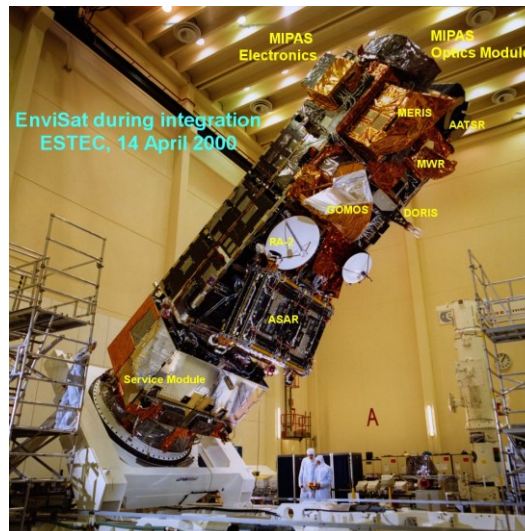
EOS-SRC, Physics and Astronomy, University of Leicester, U.K.

25/12/2002: CONTOUR: 505K

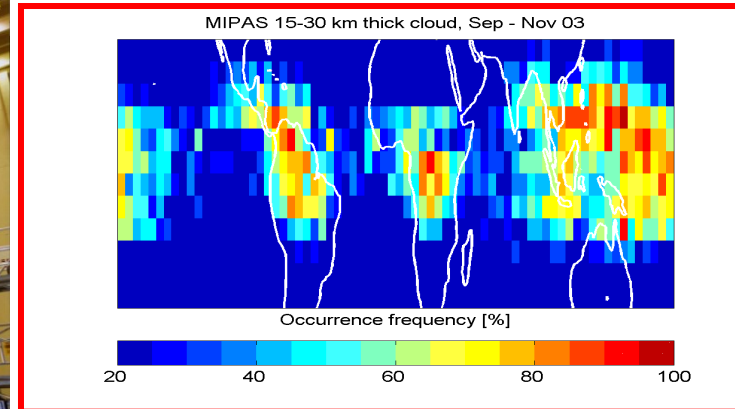


Volume Mixing Ratio [ppb]

MIPAS



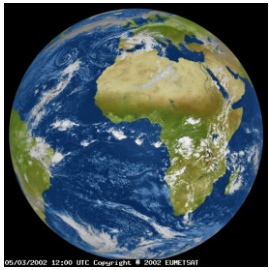
EnviSat during integration
ESTEC, 14 April 2000



MIPAS 15-30 km thick cloud, Sep - Nov 03

Occurrence frequency [%]

20 40 60 80 100



HIRDLS Science topics

Rationale

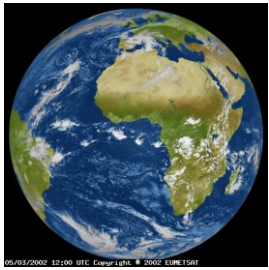
Mainly extension of work done with MIPAS (and ISAMS)

HIRDLS potential

- **High vertical resolution of 1 km (MIPAS = 3 km)**
- **High precision (HIRDLS = radiometer; MIPAS = spectrometer)**
- **UT/LS observations**

Topics

- **Ozone, water vapour and cloud variability in the tropics (UT)**
- **Polar stratospheric clouds and denitrification/re-nitrification (LS)**
- **Gravity waves – vertical and horizontal structures – synergies with other measurement techniques such as radars and nadir imagers.**
- **Updated climatologies**

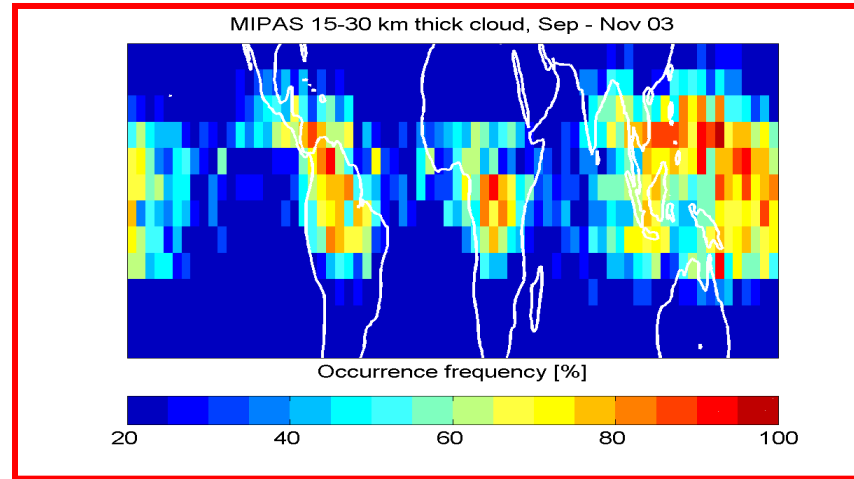


Tropical upper troposphere

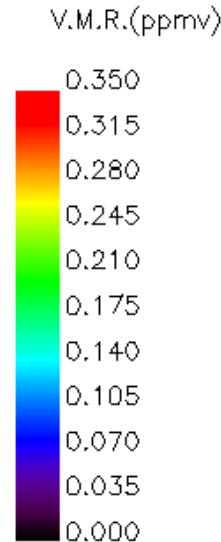
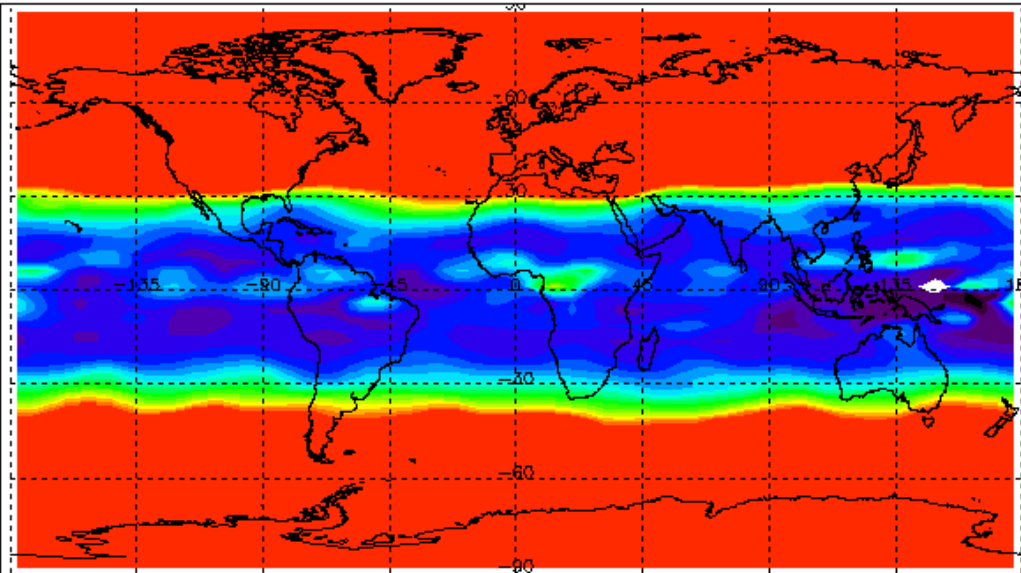
How well can we measure UT O₃, H₂O using infra-red?

How do clouds interact with ozone and water vapour?

**MIPAS cloud occurrence frequencies (seasonal average);
J. Greenhough et al., ASR, 2005)**

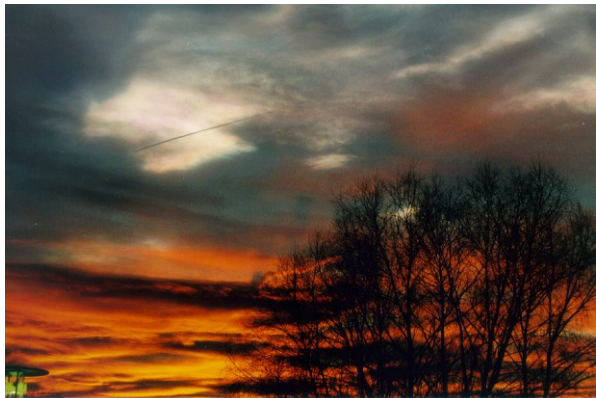
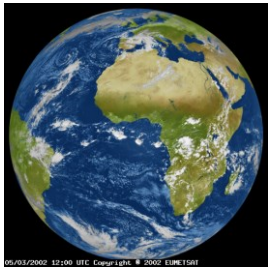


MIPAS Level 2 O₃ at 120,000 mb – GLOBAL



**MIPAS O₃ at 146 mb:
Leicester analysis**

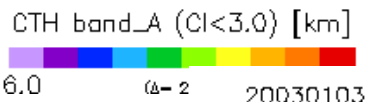
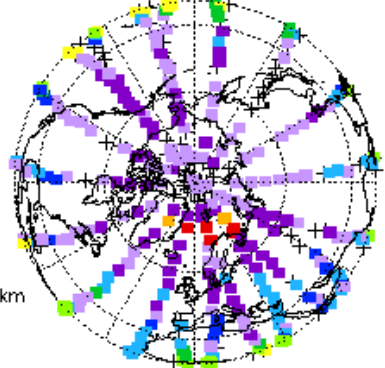
Vintersol Polar Campaign 2002/3: Does HIRDLS allow us to study PSC and nitric acid interaction at finer vertical scales? Is there sufficient vertical information to allow us to test models of denit/renitrification, e.g. NAT rocks?



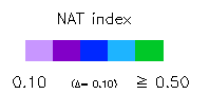
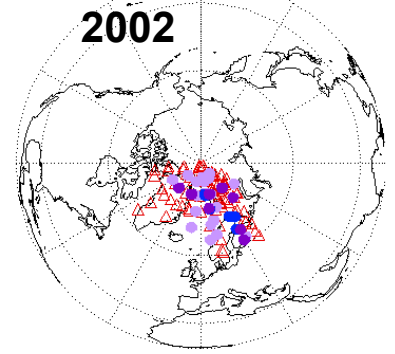
MIPAS
02/12/02

Cloud Top Height > 12 km
Absolute Lat. > 50
min height = 12.4 km
max height = 24.5 km

DATE: 20021202 (MISC: TIME CLOUDS)



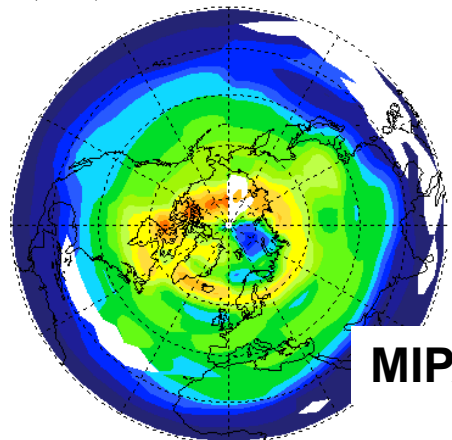
**NAT PSCs, 2nd
week, December
2002**



MIPAS

provided by:

03/01/2003: CONTOUR: 505K

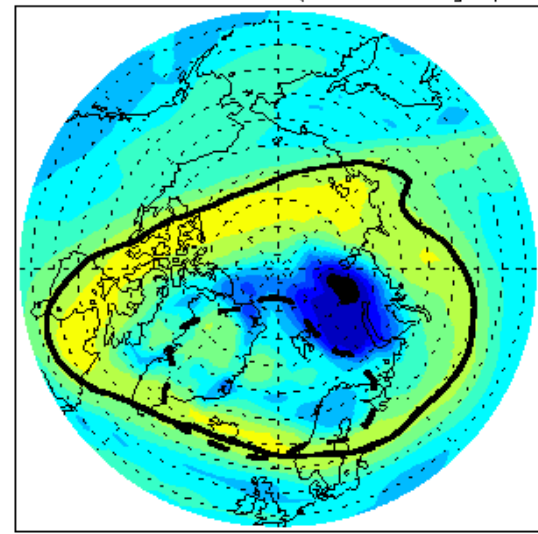


Volume Mixing Ratio [ppb]

**MODEL
DENITRIFICATION
(LOSS OF HNO3):
03/01/2003**

**Leeds, Leicester,
Davies et al., ACP,
2006**

MIPAS 03/01/2003



gas phase HNO3 (ppb)

