Summary item 3

◆ **ESA and WP9 part 1 (45m)**

- DataGrid Frascati infrastructure (AT, 7.5m)

- **ESA GOME application:** Neural Network Ozone Profile Retrieval From GOME Observations (NOPREGO) – (SC, 7.5 m)

- ESA experience in using DataGrid testbed 0 and testbed 1 (JL, 15m)
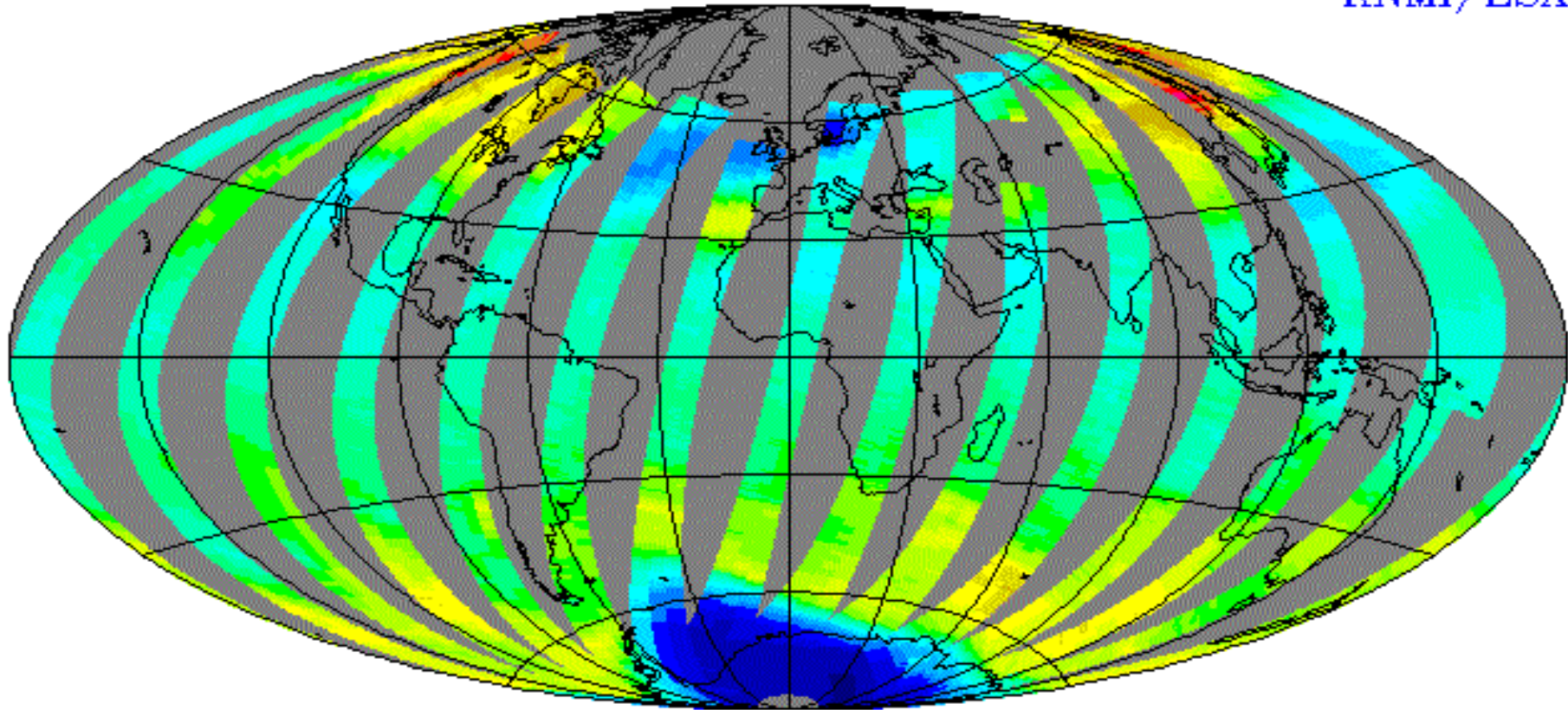
Institutions involved in neural processing

- ◆ **ESA/ESRIN –** Infrastructures, GOME data

- ◆ **University of Tor Vergata (Rome, Italy) –** Ozone profile and cloud fraction

- ◆ **KF University (Graz, Austria) –** Total ozone, total water vapour and cloud top height

GOME Instrument (1 day coverage)

FD TOTAL OZONE VALUES

KNMI/ESA

Computation of Ozone Profiles (1)

◆ **GOME Input data (level 1)**

  ▪ Generated at DLR, archived at ESA

◆ **Unit data chunk: complete orbit or part of it**

◆ **GOME output products (level 2)**

  ▪ Reference Products generated at DLR, at KNMI, …

◆ **GOME level 2 processing schema in WP9**

  ▪ KNMI (OPERA) – 1day data requires 20 days processing

  ▪ ESRIN (NOPREGO) - Neural Network approach for fast delivery experiment

Computation of Ozone Profiles (2)

◆ **Neural Network approach for level 2 products**

- GOME Input data (level 1)

- Information used in neural network experiment

  - **Solar and Earth shine spectral radiances**
  - **Geometric info (solar zenith angle, line of sight)**
  - **No radiance calibration required**

- **Overall # of inputs: 28**

◆ **Unit data chunk: complete orbit or part of it**

The neural processing approach

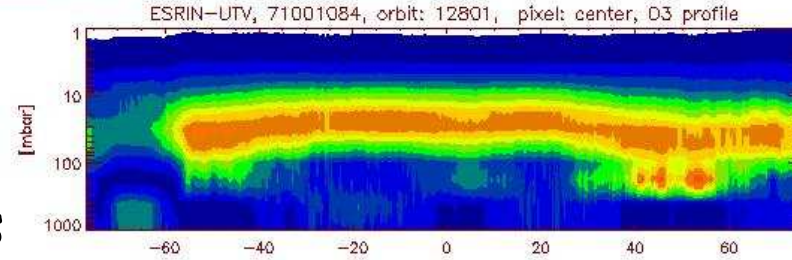28 input neurons

28 hidden neurons
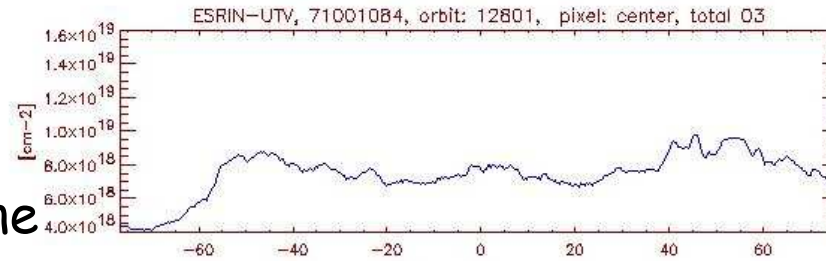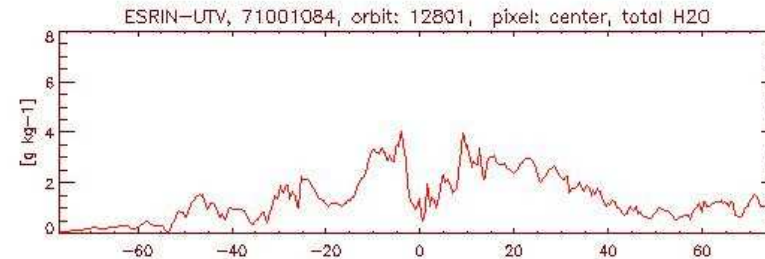
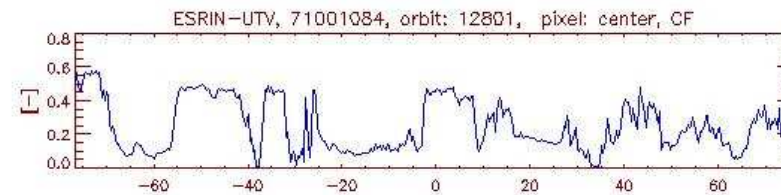20 output neurons
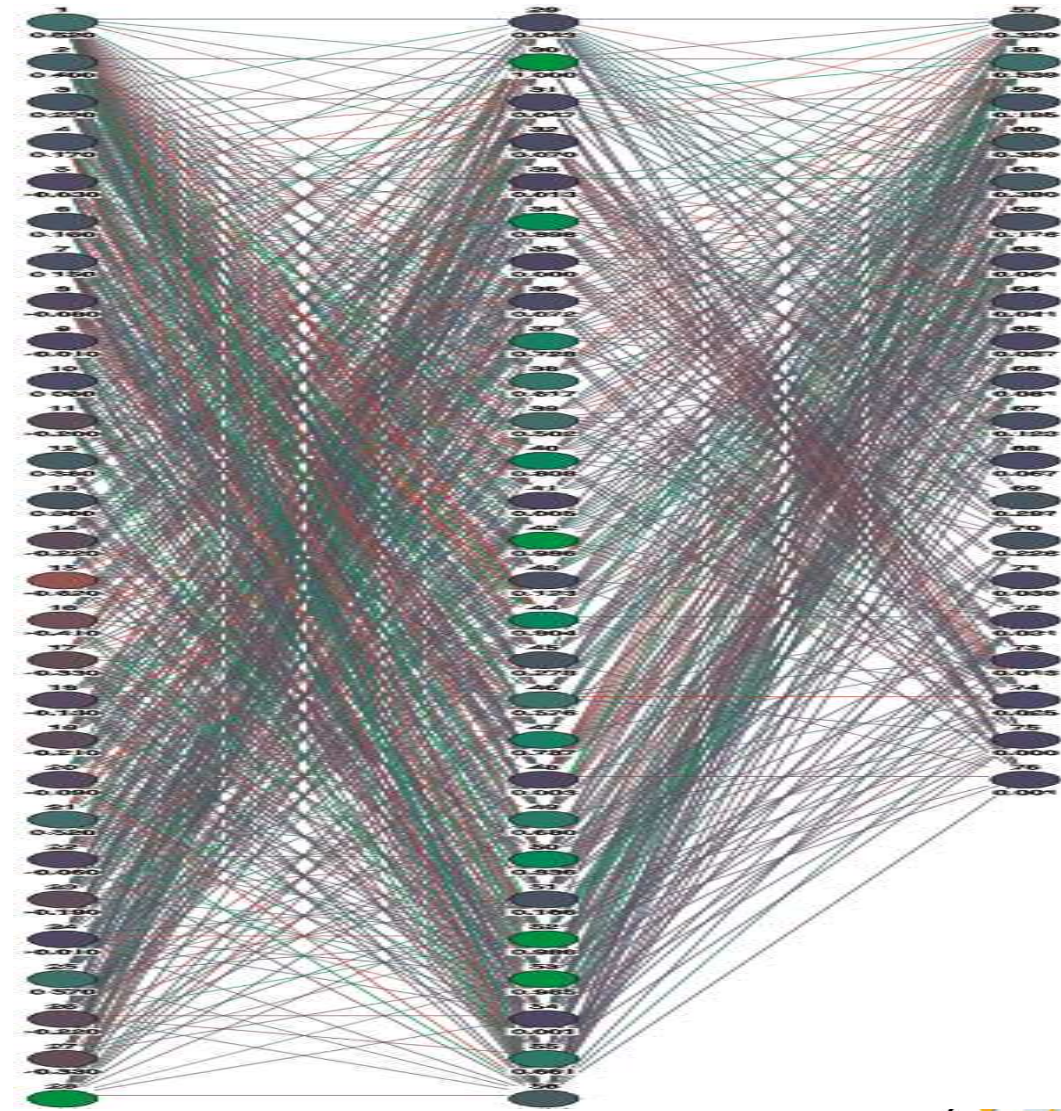
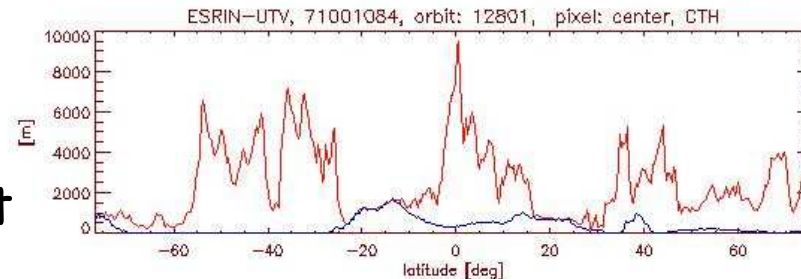# The output products

Ozone profiles

Total Ozone

Total Water Vapour

Cloud Fraction

Cloud Top Height

Why DataGrid?

- ◆ Data volumes:

  - No measurements: 28000 retrievals/day (14+ orbits)

  - Total level 1 data input: 200 MB/Day ➔ 80 GB/Year

  - Total level 2 products output: 15 MB/Day

- ◆ Reference processing: computation intensive

- ◆ Neural Net Processing Time: 4.5 min/day

  - Alternative science approach (e.g. parametric optimisation)

  - Real time applications possible

- ◆ DataGrid demonstration

  - Collaborative validation (e-science) of alternative processing methods against ground lidar measurements

  - Future: interactive profile generation over user selected area through web-portal