SCIAMACHY Validation

Satellite Intercomparions

Ozone Column

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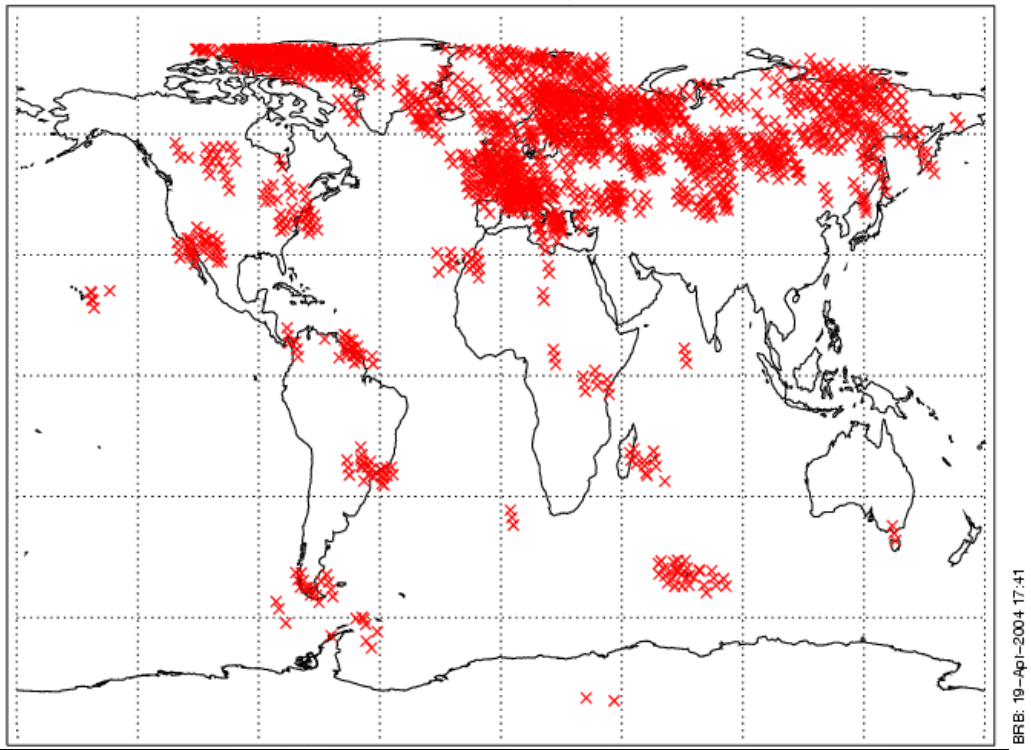
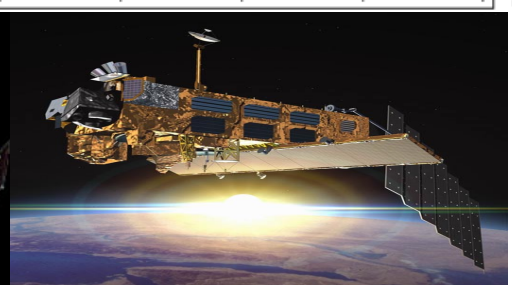
NOAA-16/SBUV/2 vs. SCIAMACHY Comparisons

- **Orbit crossing time**
  - NOAA-16: 1430
  - Envisat: 1030
- **Comparisons**
  - Period: July 17 to Dec 17 2002
  - Match numbers: 3080
  - Coincidence: 1936 at +/- 6 hours
  - SBUV/2 Version 8 integrated profiles
  - SCIAMACHY: Version 5.1 validation data set





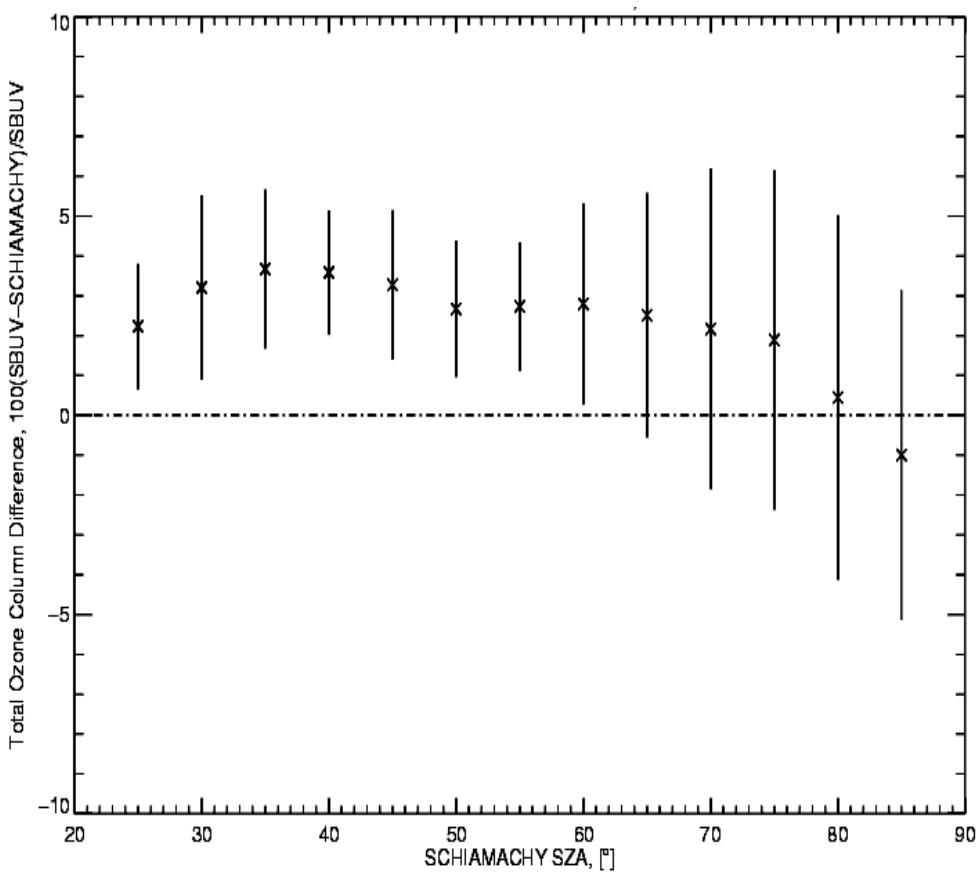
SBUV/2 vs. SCIAMACHY
Solar zenith angle dependence

- **SBUV/2-SCIAMACHY**
  SBUV/2

– **SCIAMACHY is ~3% low**

– **SZA dependence at >60°**

– **Std. Dev. +/- 1 to 4%**



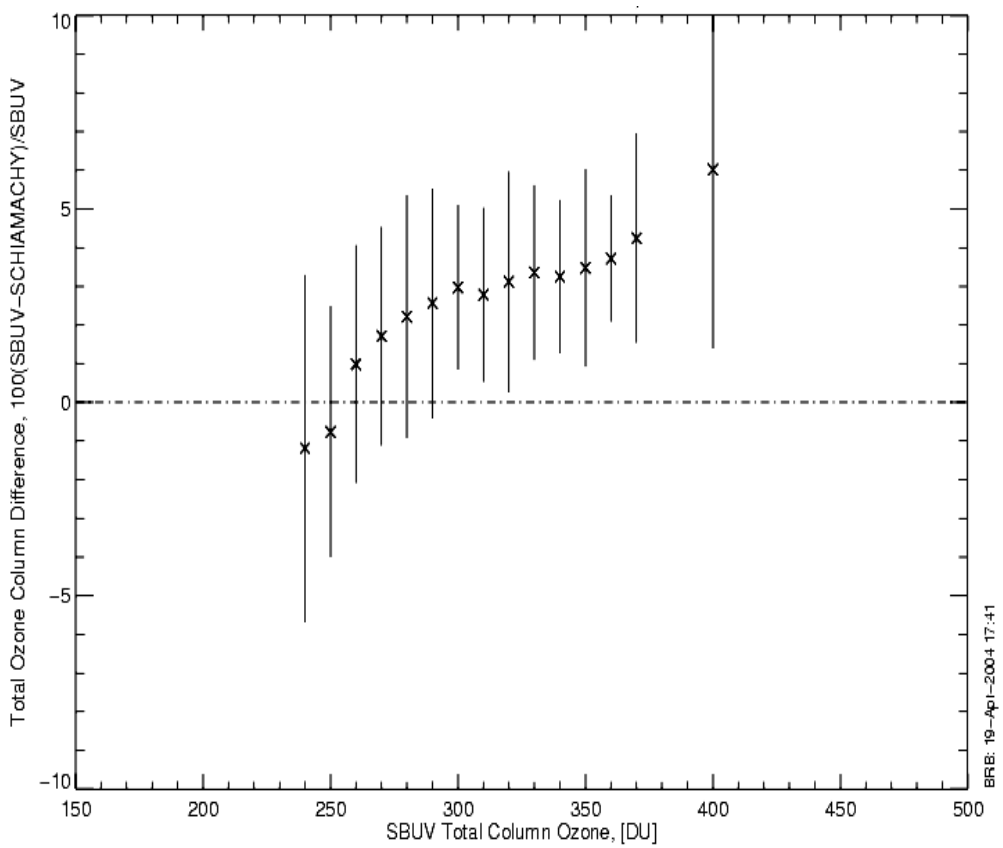
SBUV/2 vs. SCIAMACHY
Total ozone dependence

- **SBUV/2-SCIAMACHY**
  SBUV/2

– **SCIAMACHY is low: -1 to 4%**

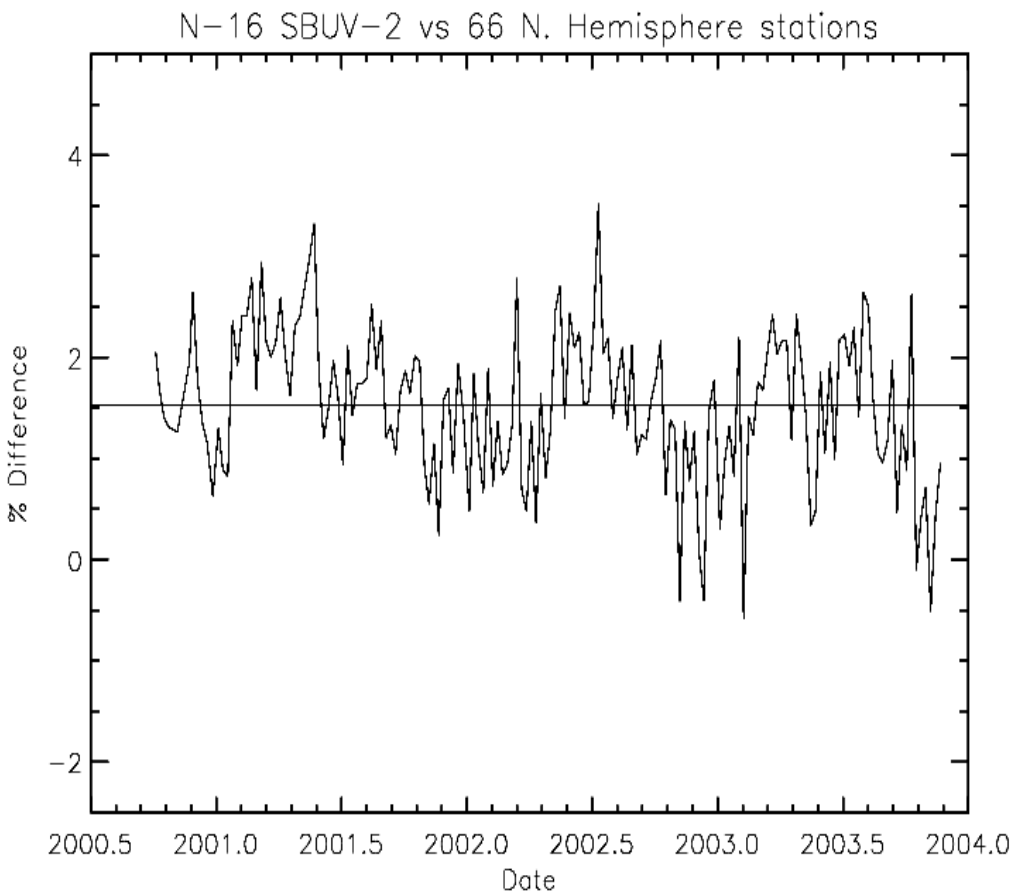
– **Total ozone dependence from 250 to 400 DU**

– **Std. Dev. +/- 2 to 5%**



SBUV/2 vs Northern Hemisphere Ground Stations

- **<u>SBUV/2-Stations</u>**
  SBUV/2
- **66 reliable stations**
- **200 km matchup**
- **Daily, ~40/day, matchups average over week**
- **SBUV/2 is 1.5% higher**
- **1% seasonal dependence**



SCIA vs GOME - 2 calib orbits (20020823)

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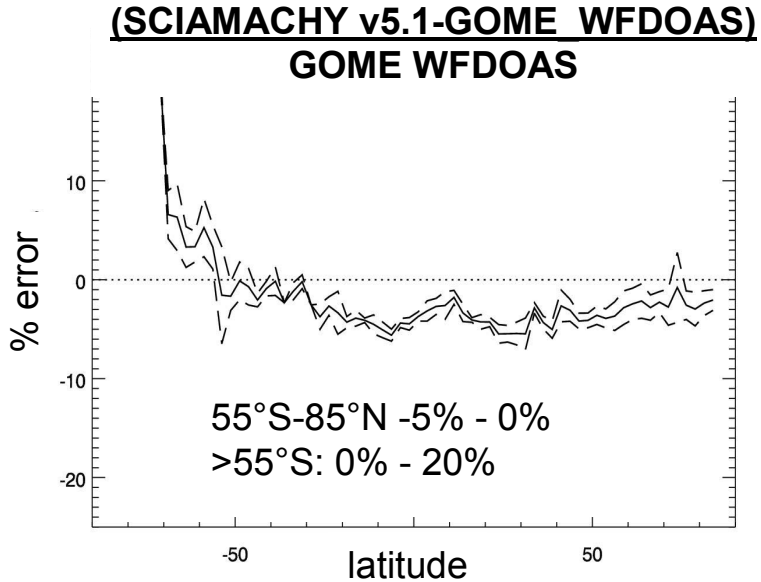

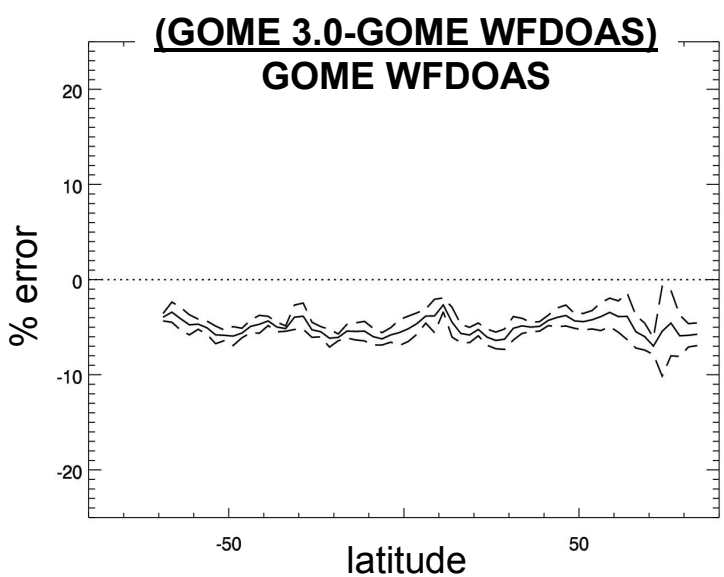

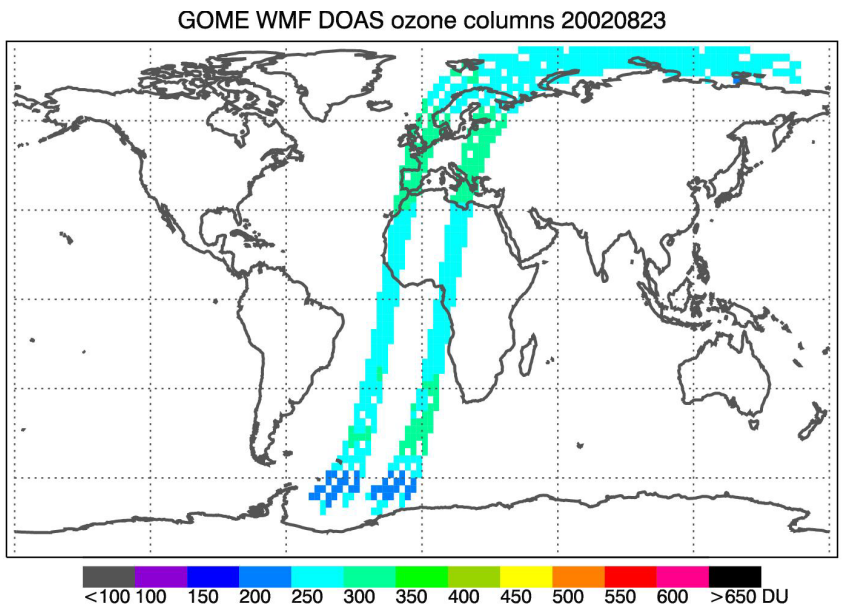

- **SCIA v5.1: big improvement to former versions!**
- **Comparison with WFDOAS is consistent with SBUV/2**

- Conclusion -
SCIAMACHY Total ozone

- Validation product coverage was limited

- With respect to SBUV/2
  - SCIA is ~3% low (~3%)
  - Seasonal and solar zenith angle dependence (~4%)

- With respect to ground stations
  - SBUV/2 is 1.5% higher (with 1% seasonal dependence)
  - Therefore SCIA is 1.5% lower than ground stations
  - KNMI TOSOMI/SCIA retrievals are 1.5% lower (4.9%)

- With respect to GOME
  - SCIA is low by 5% (WFDOAS) with solar zenith angle dependence
  - SCIA is high by 2% (GOME-3) with solar zenith angle dependence

- Major improvement over first release