SCIAMACHY Validation
Satellite Intercomparisons
Ozone Column

E. Hilsenrath
NASA Goddard Space Flight Center

B. Bojkov, G. Labow
Science Systems and Applications, Inc

A. Bracher
University of Bremen

Atmospheric Chemistry Validation of ENVISAT - ESRIN - 3-7 May 2004
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-Stations
  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)

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

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- 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