

GOMOS Ozone Profile Validation ACVT subgroup

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And

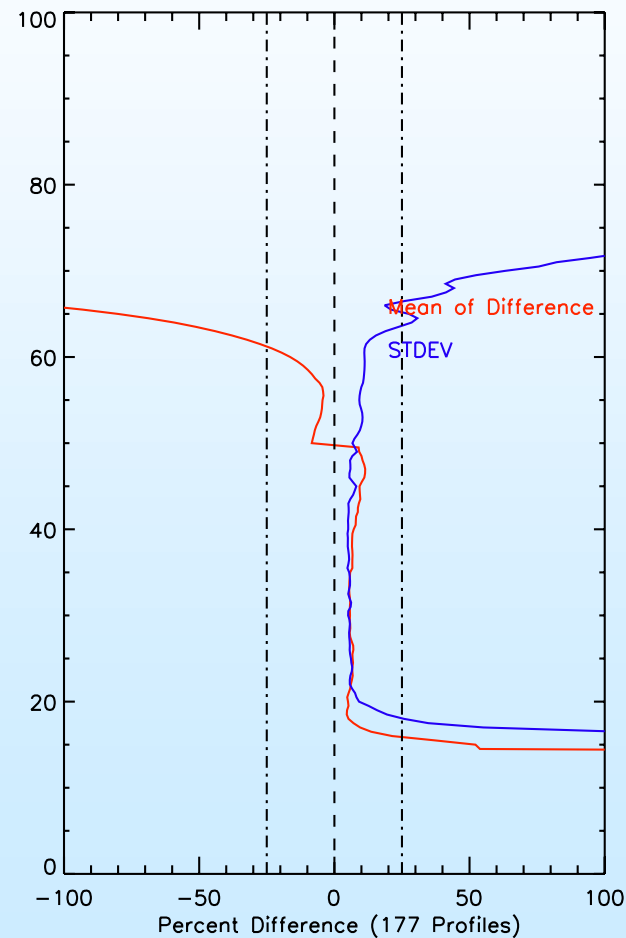
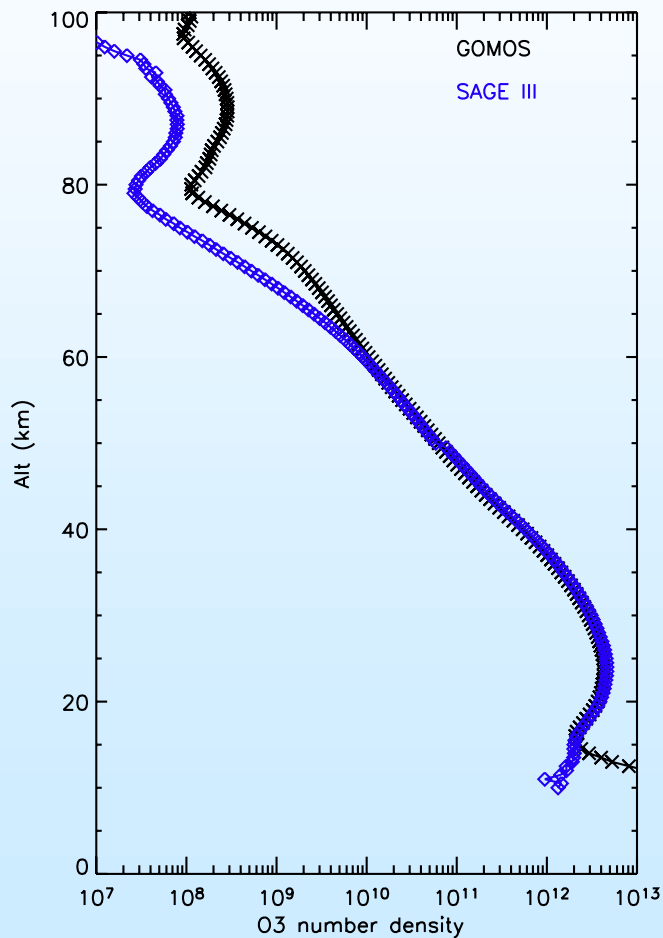
F. Goutail and A. Bazureau

CNRS/IPSL

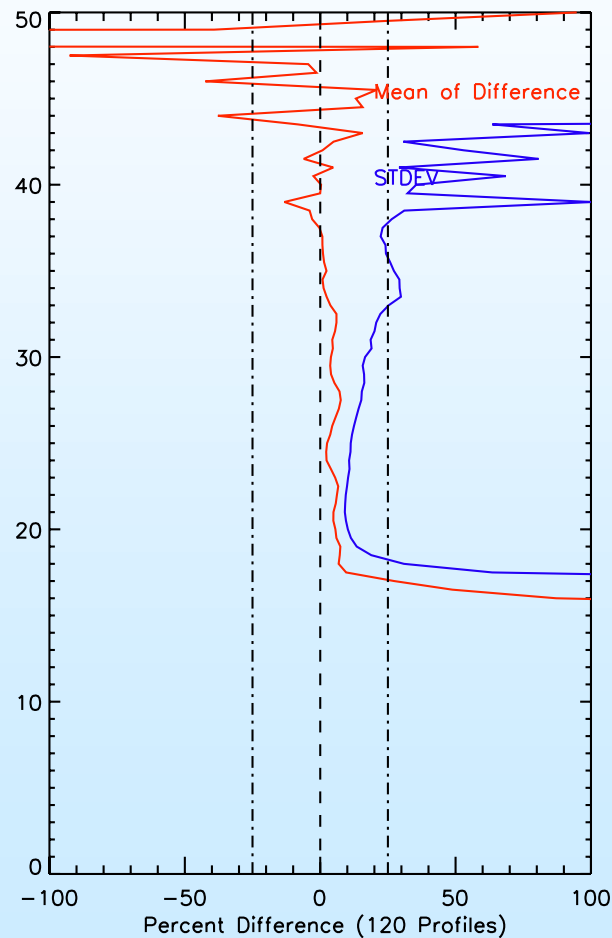
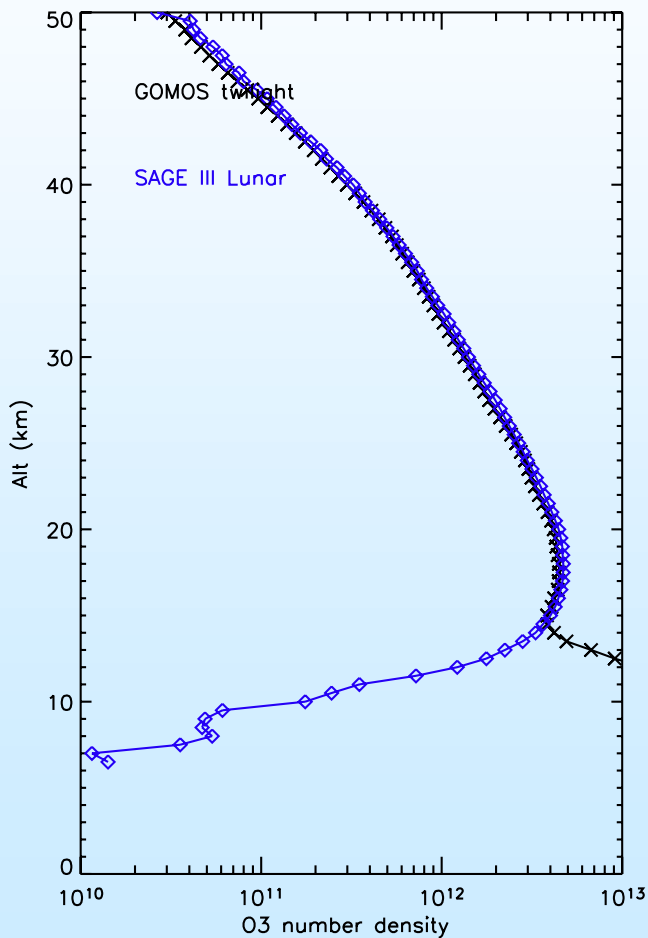
Comparison with SAGE III

- Pair comparison
- Pair selection criteria:
 - Time difference within 24 hours
 - Latitude difference within 3 degree
 - Longitude difference within 10 degree
- May, June, and July 2002 data for GOMOS twilight data comparison
- 12 months of 2002 SAGE III Lunar data used for comparison with GOMOS twilight data

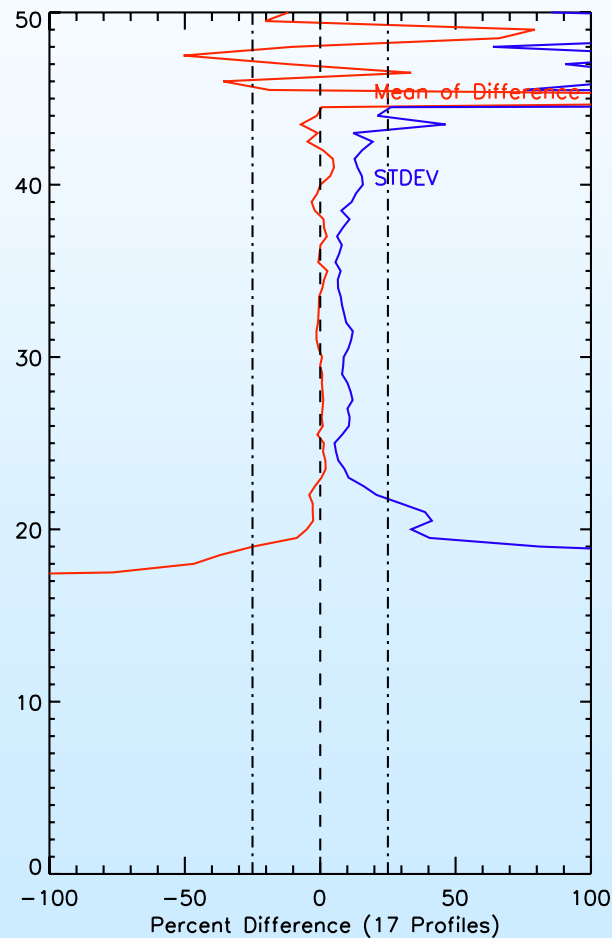
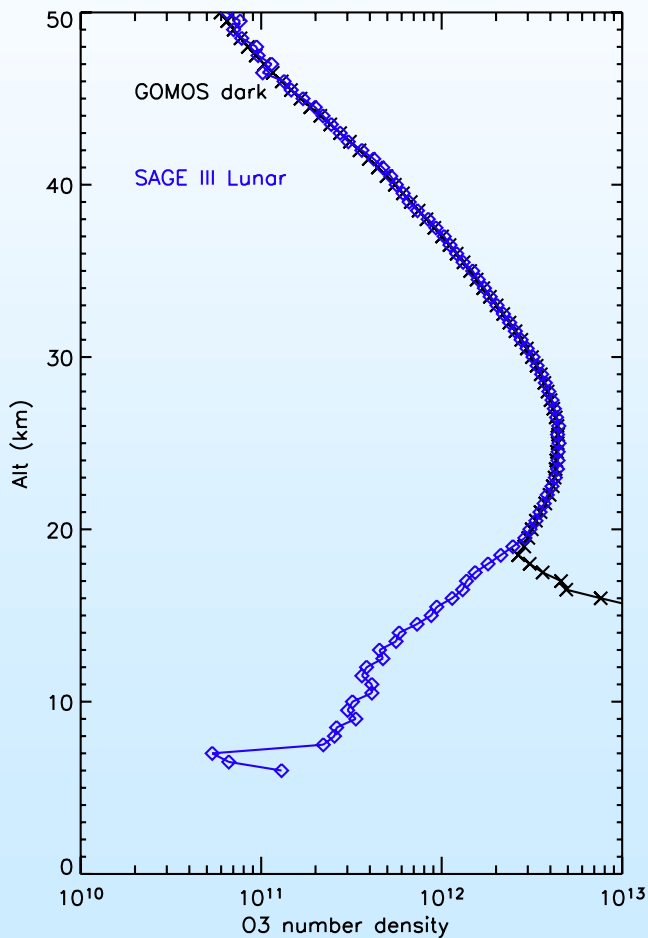
SAGE III (Solar) - GOMOS (Twilight)



SAGE III (Lunar) - GOMOS (Twilight)



SAGE III (Lunar) - GOMOS (Dark)



Conclusions

- SAGE III solar data agrees well with GOMOS twilight data with positive bias of about 6 % from 18 to 50 Km
- SAGE III Lunar data agrees well with GOMOS twilight data to within 5 % from 18 to 40 Km altitude
- SAGE III Lunar data agrees very well with GOMOS dark data for 17 pair profiles. Need more coincident measurements for statistical significance
- Lighted data from GOMOS compares poorly with SAGE III data



GOMOS O₃ validation with POAMIII AO317 : F. Goutail, A. Bazureau Service d'Aéronomie, CNRS/IPSL, France



- Two latitudes 53°-71°N and 57°-65° S
- From Aug. 2002 to Feb. 2003

Twilight observation conditions : 258 files

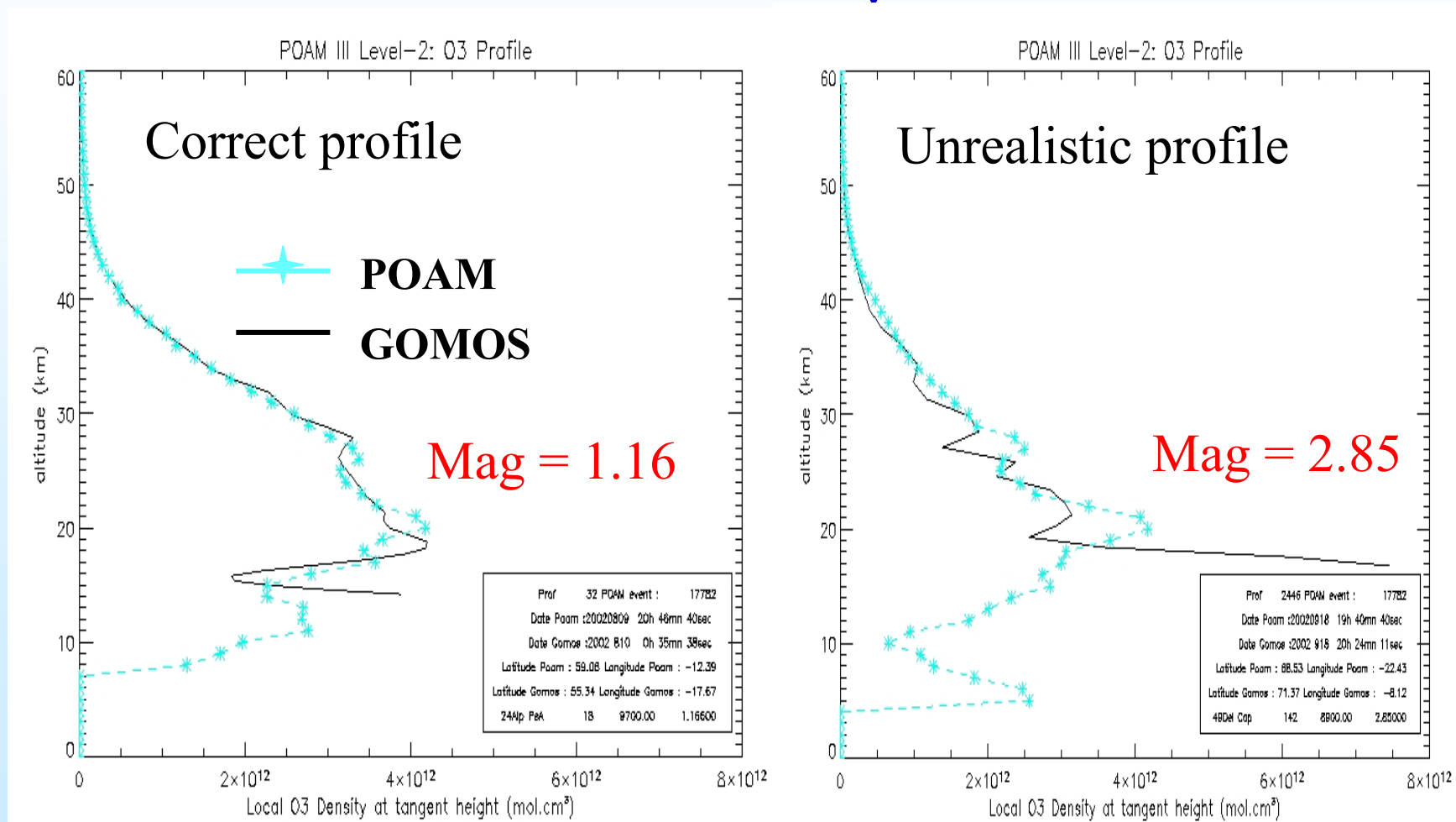
198 coincidences in Northern Hemisphere

80 coincidences in Southern Hemisphere

- Coincidence Criteria: 600km, 24h

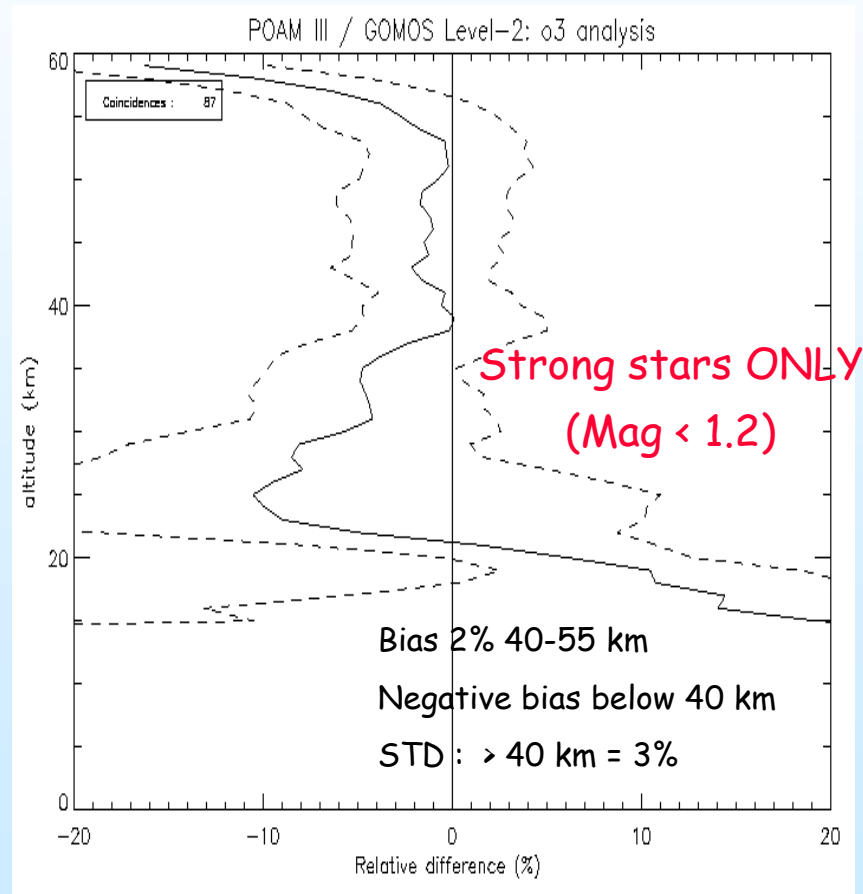
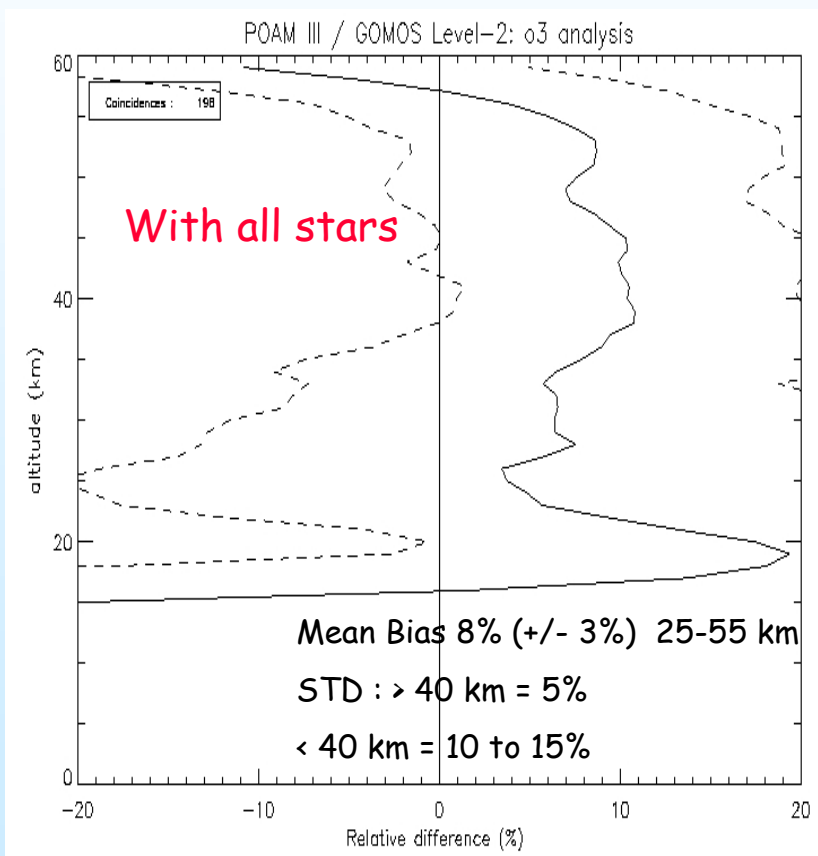
POAM III PRECISION		
	Northern Hemisphere	Southern Hemisphere
O ₃	5 to 10% (13-60 km)	5 to 10% (13-60 km)

Northern Hemisphere



Northern Hemisphere

Mean Relative Difference (%)



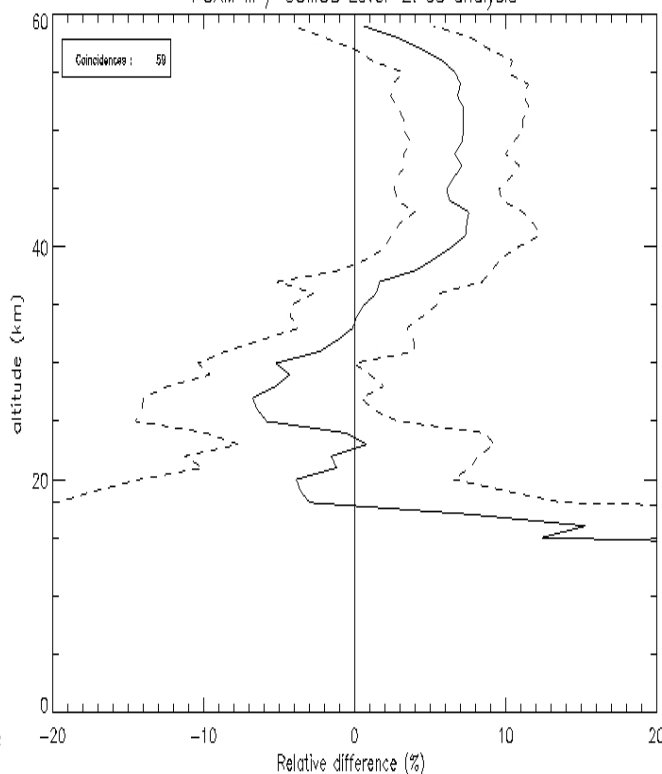
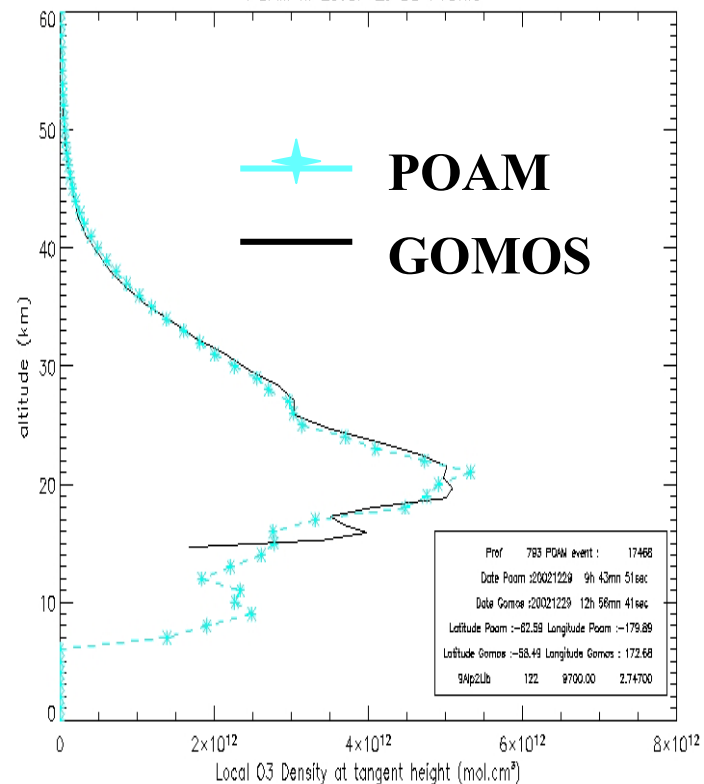
Southern Hemisphere

Example of profile

Mean Relative Difference (%)

POAM III Level-2: O3 Profile

POAM III / GOMOS Level-2: o3 analysis



No star dependence revealed...

Why? Strong stars only ?

Quality better than in Northern Hemisphere : why ?...

It seems that there is a Problem of altitude registration POAM / GOMOS ?

Conclusion

- If only realistic profiles taken into account
- Northern Hemisphere:
 - Bias 2% 40-55 km
 - Negative bias 8 % 20- 40 km
 - STDeviation : > 40 km = 3%
 - Below 20 km unrealistic
- Southern hemisphere
 - 40-55 km positive bias 8 %
 - 20-40 km no bias but large deviation: $\pm 8\%$
 - Below 20: unrealistic

Validation of GOMOS-Lv-2 data O_3 product GOPR 6.0a with SAGE II 6.2

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Bremen, Germany

Comparison of GOMOS (6.0a) O₃ profiles with SAGE II (6.2)

367 collocations for 01.09.02 - 31.03.03:

157 at 30°-60°, 96 at 30°- -30°, 56 at -60°- -90°, and 58 at -30°- -60°

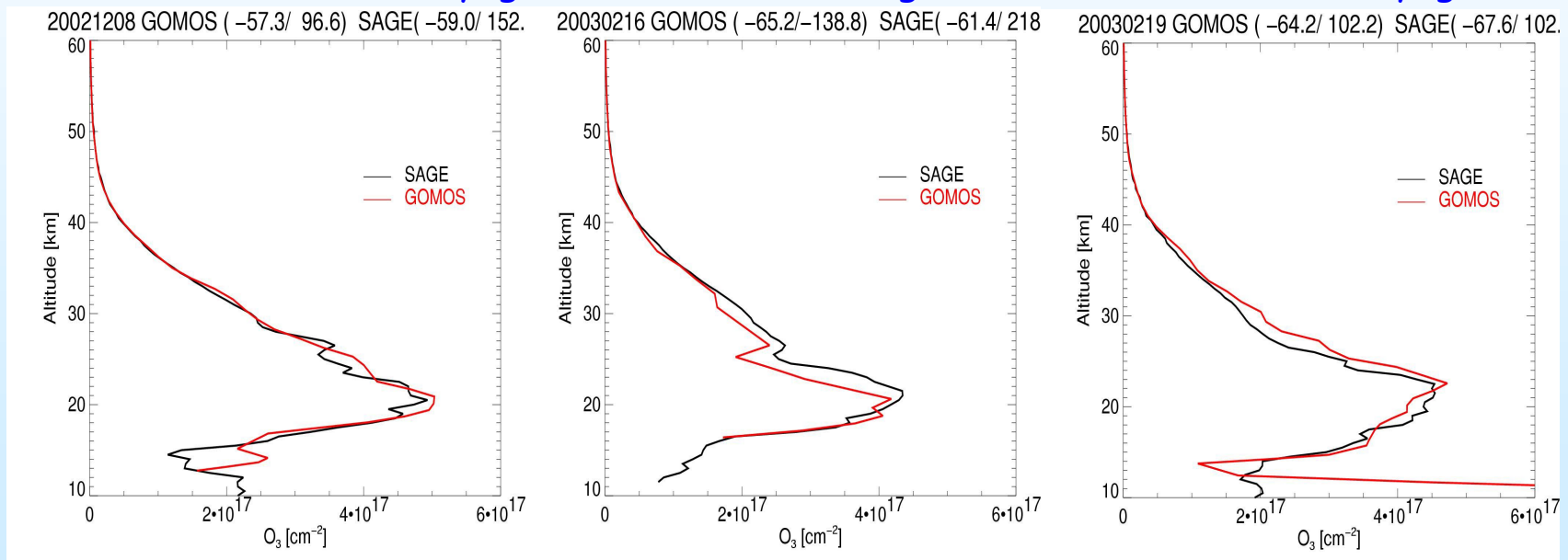
177 dark, 7 daylight, 30 twilight, 97 straylight, 56 two- and straight observations

Examples from high southern latitudes

GOMOS two- and straylight

GOMOS twilight

GOMOS daylight



SAGE II within 250 km of GOMOS measurements during the same day

Accuracy of SAGE II O₃-Profiles at 10-50 km 10%

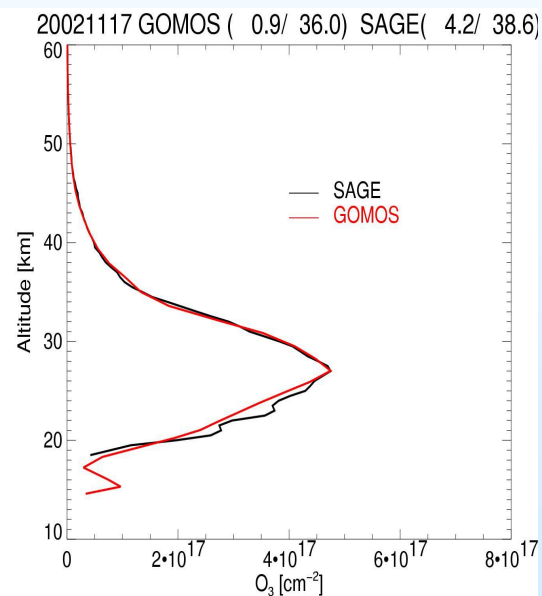
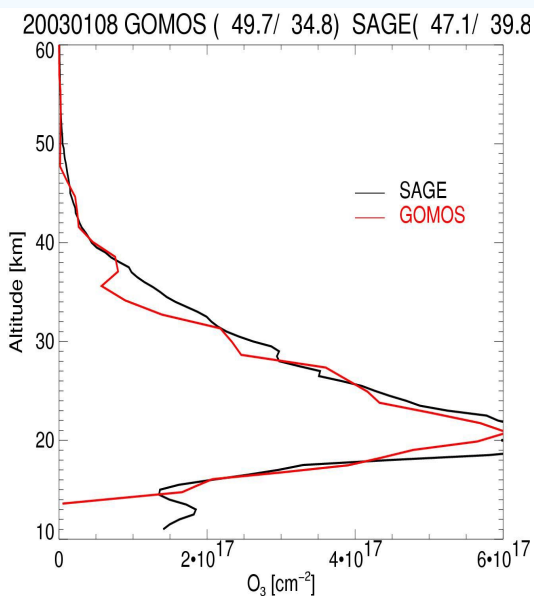
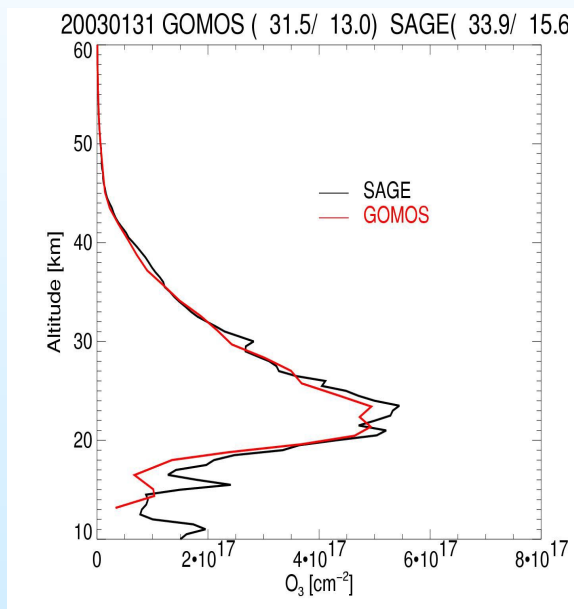
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Comparison of GOMOS (6.0a) O₃ profiles with SAGE II (6.2)

Mid northern latitudes
GOMOS dark

GOMOS straylight

Tropics
GOMOS dark



nearly all collocations show good agreement to SAGE II from ~20 km until the altitudes where SAGE II ozone is validated!

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Overall Conclusions

- Precision of GOMOS ozone profiles
 - Based on GOMOS comparisons with SAGE III, SAGE II and POAM III, the precision of GOMOS ozone profile is within 15 % between 20 Km and 40 Km.
- Accuracy of GOMOS ozone profiles
 - From the comparisons, the mean difference of GOMOS ozone profiles to the three other satellite instruments is within 10 % between 20 Km and 40 Km. GOMOS data appears to be positively bias.