

**GOMOS O3
ACVT MA**

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ACRI-st**

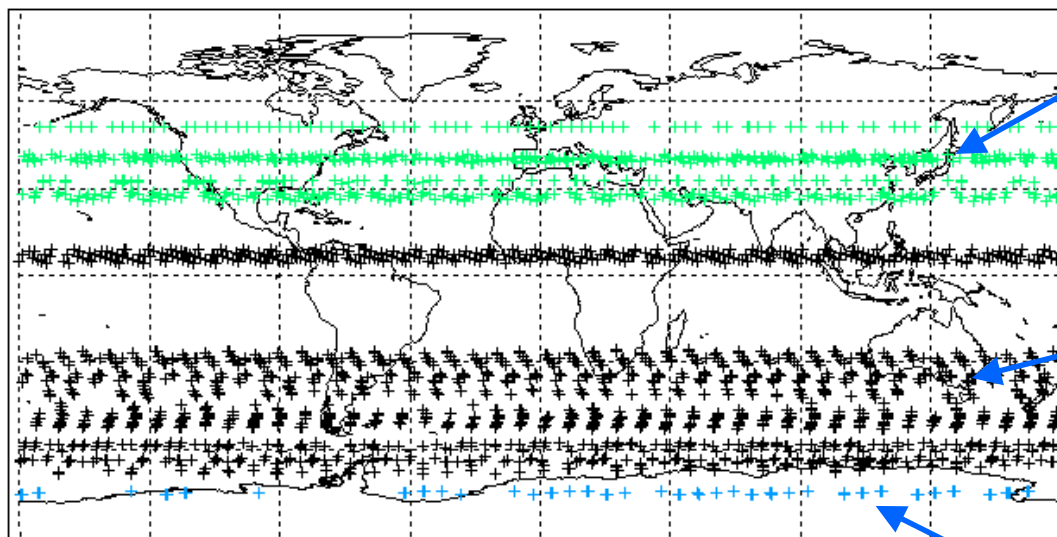
Introduction

- Only results from AO 160 Ozval
- Time constraints prevent to perform an extended validation
- More results expected soon from AO 160 but also from other contributors

- This study focused on measurements performed in August 2003
- Assimilation of GOMOS O₃ measurements in the MSDOL system aiming at:
 - Extending the number of coincidences with external validating measurements
 - Statistically analyzing the differences between the model and the observations

Locations of the selected GOMOS O₃ measurements

Cycle 19 (11/08/2003 – 13/09/2003)
 STD < 10%, verticality < 30°, PCD = 0, DBFLAG = / 1
 2050/12402 profiles selected

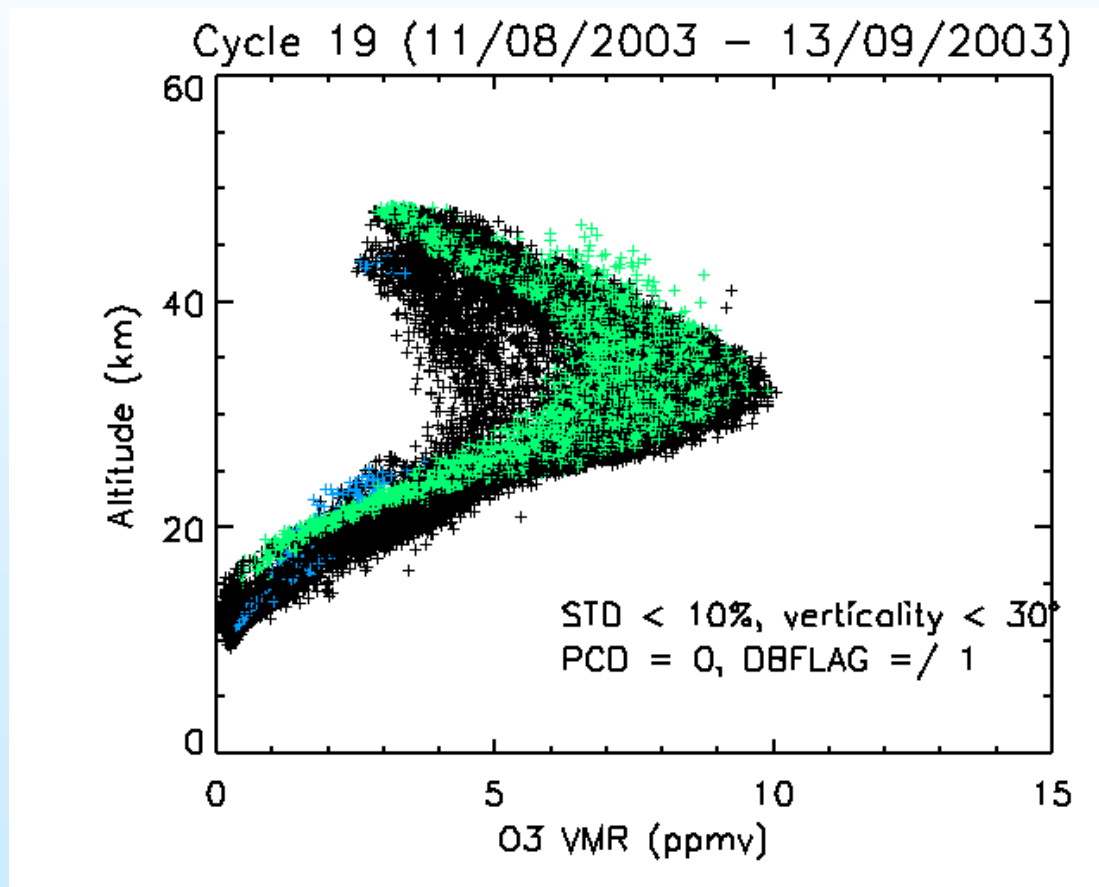


« Straylight »

« Dark »

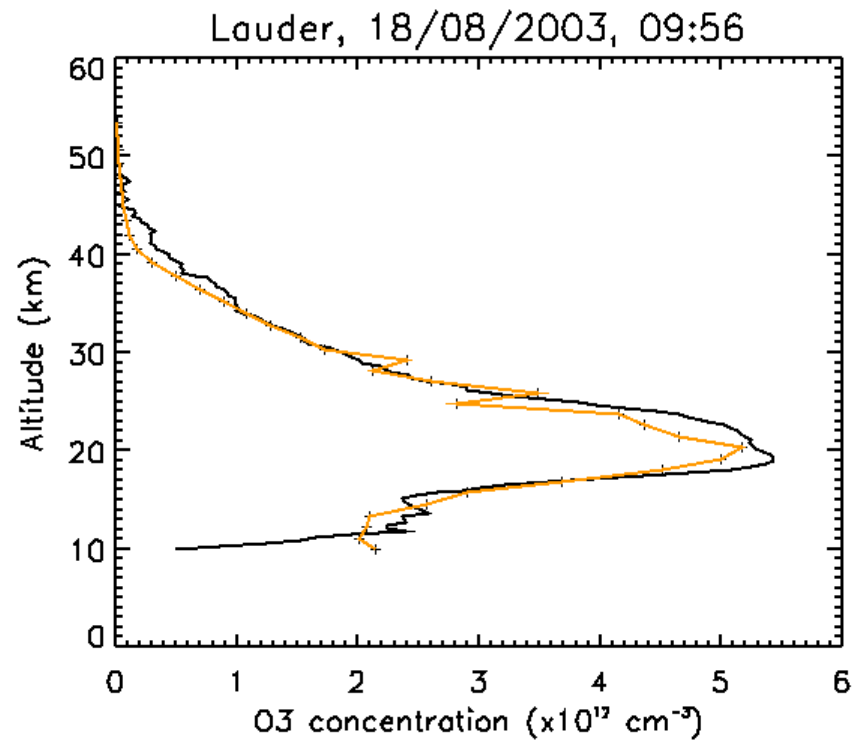
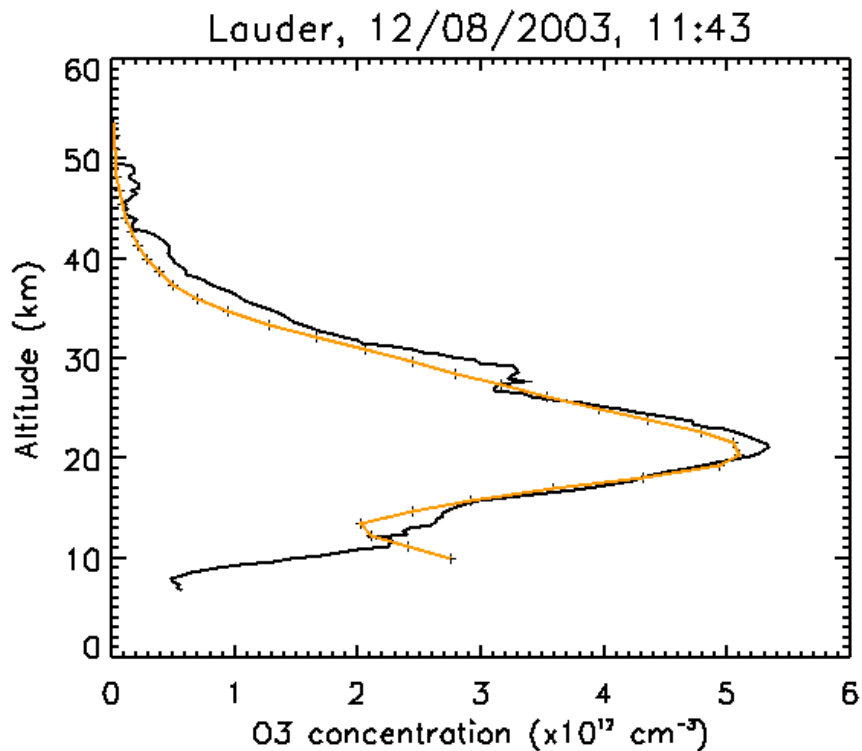
« Twilight »

Aspect of the selected GOMOS O3 measurements



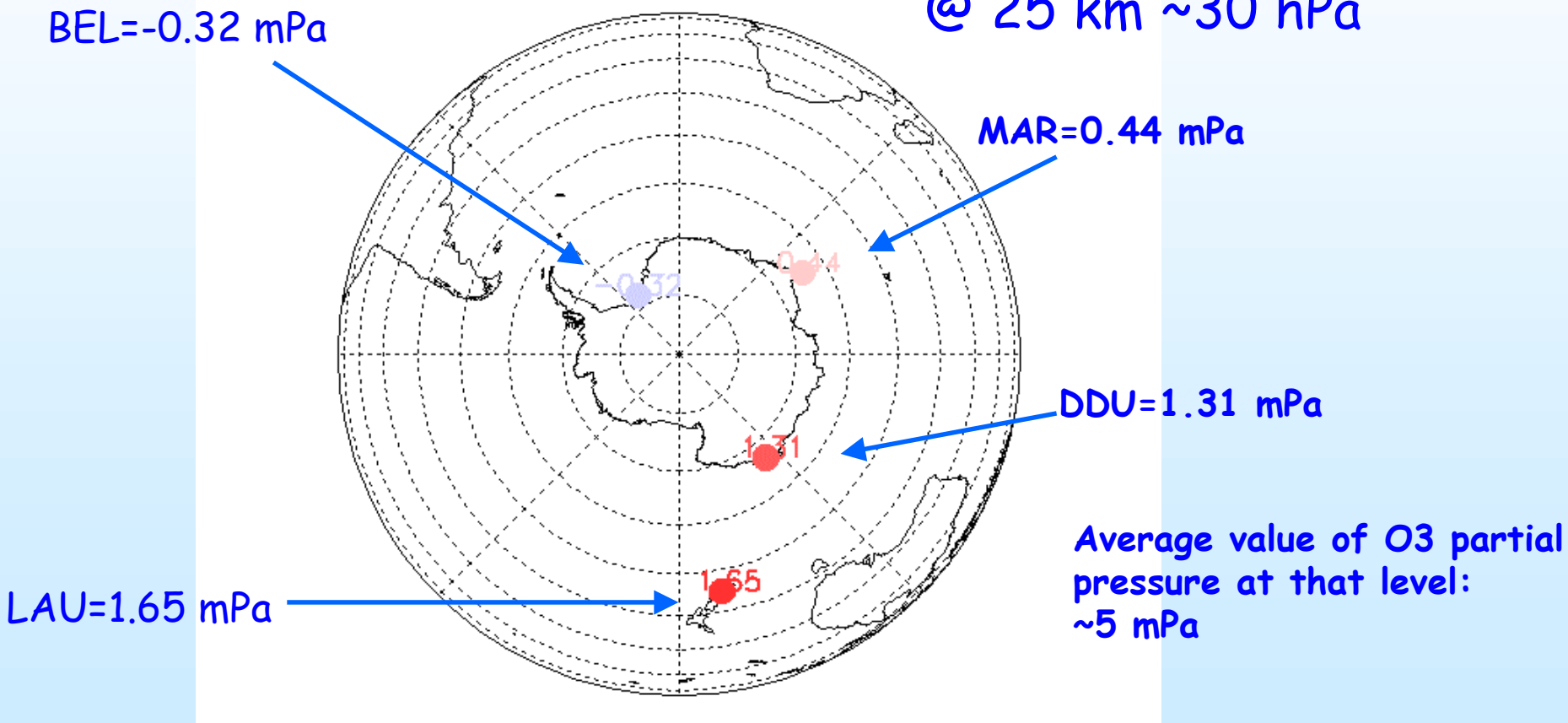
Green : straylight
Black : dark
Blue : twilight

Comparison between assimilated field and lidar O3 sounding - period 12-18 August 2003

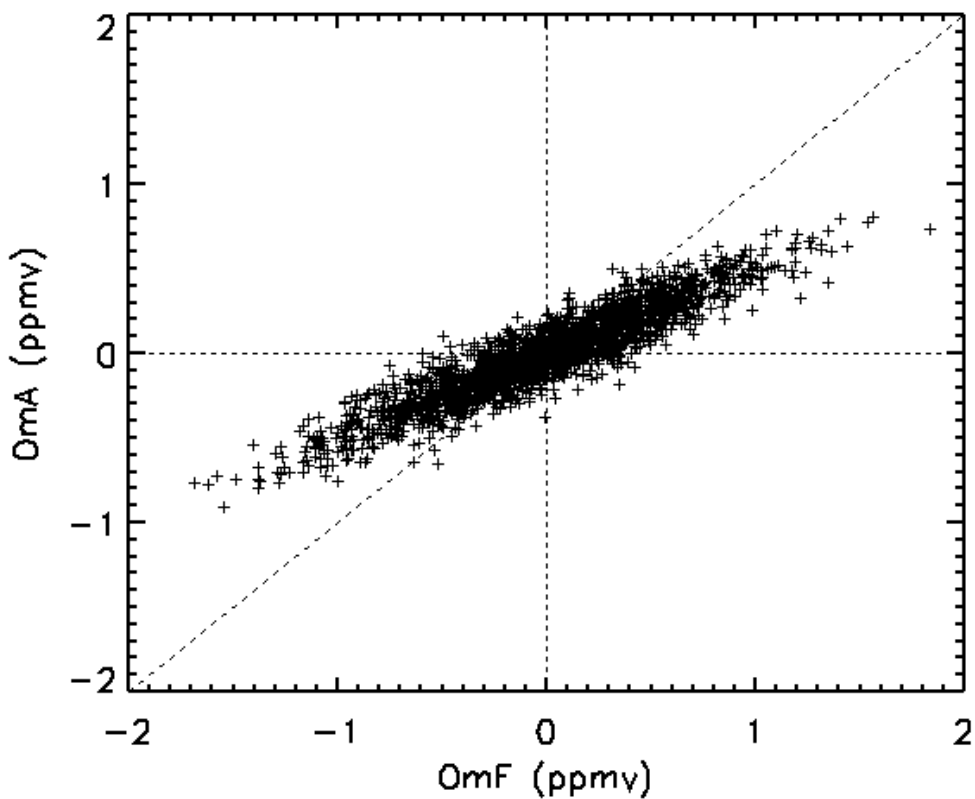


Average difference between assimilated field and balloon O3 soundings - 14-17 August 2003

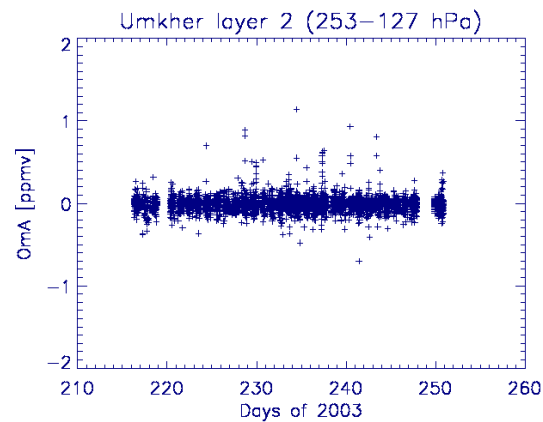
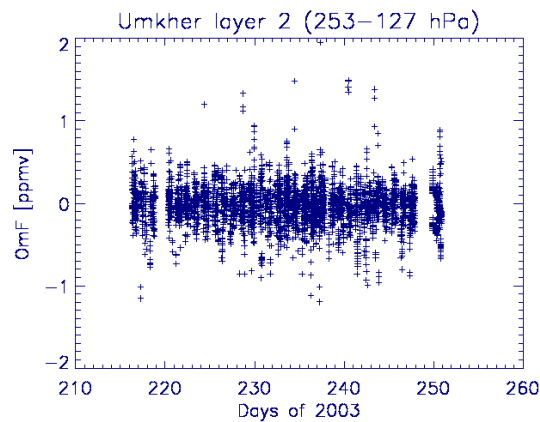
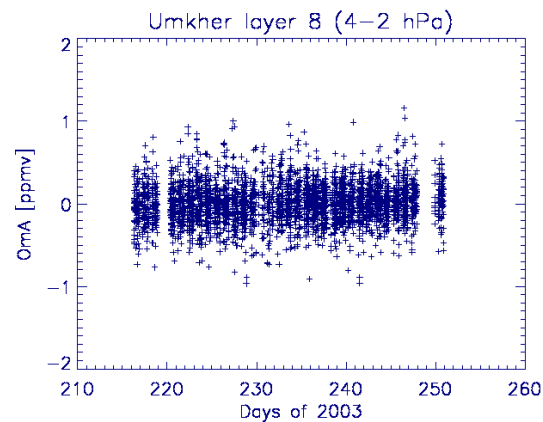
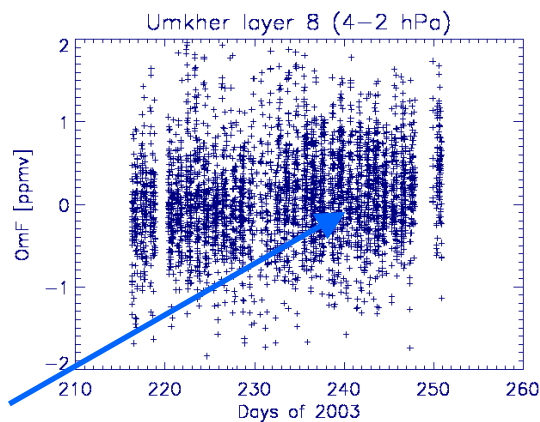
@ 25 km ~30 hPa



OmA vs. OmF: a verification that Assimilation performs well

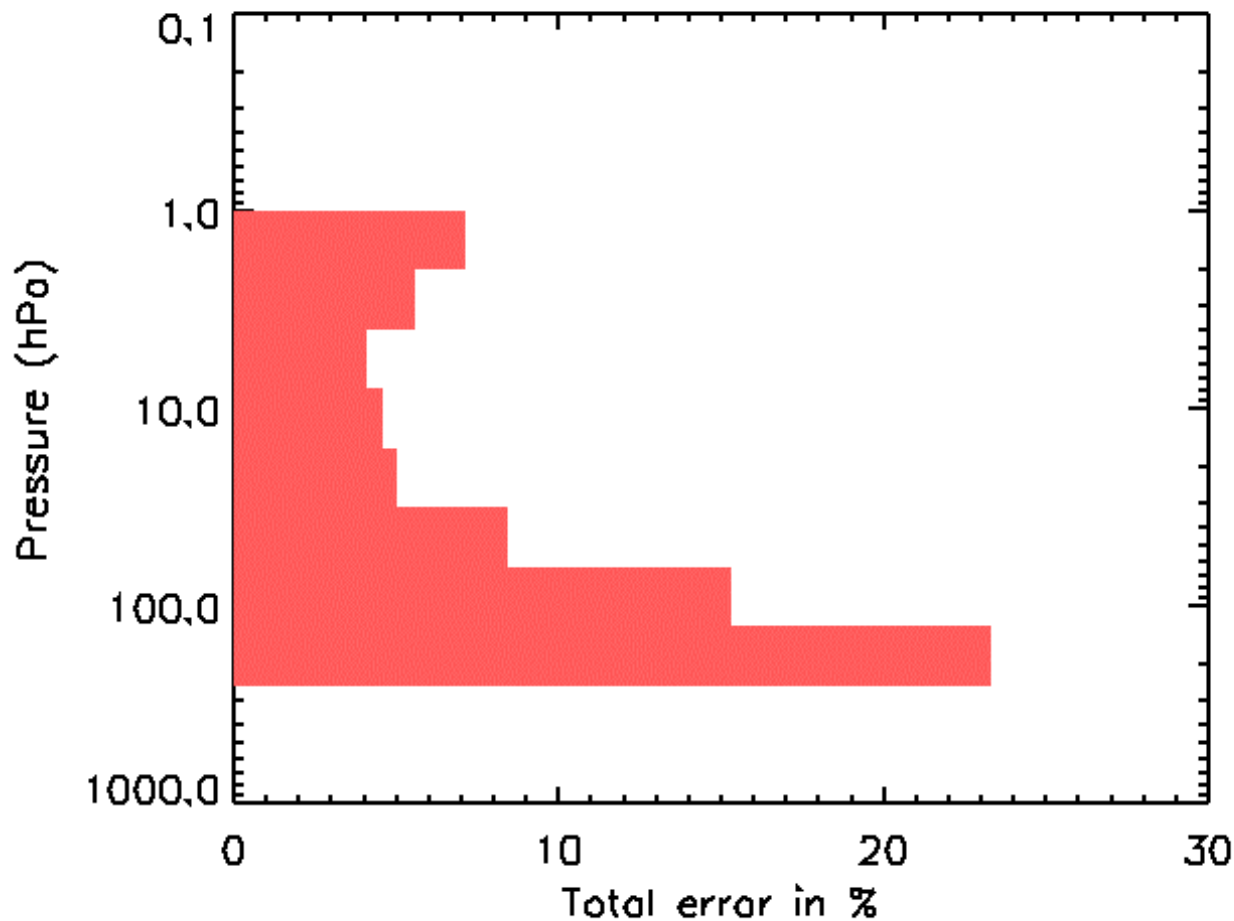


Time evolution of the OmF and OmA



Possible bias ?

Estimation of the precision of O3 GOMOS measurements



From the covariance of the OmF. Indeed:

$$\text{Cov}(\text{OmF}) = \text{Cov}(\mathbf{E}_{\text{meas}}) + \text{Cov}(\mathbf{E}_{\text{mod}})$$

Conclusions

- Precision of GOMOS ozone species:
 - Better than 5% in the range 30-4 hPa (~25-40 km)
 - High variability below 100 hPa (~15 km) translates into a lower precision (~20-30 %)
 - May depend on the occultation characteristics, latitude... Need for a larger dataset!

- Accuracy of GOMOS ozone species
 - Obtained by comparison with independent measurements
 - Could be within 10 and 30 % but the validation dataset is too restricted to draw statistically significant conclusions... Need for a larger dataset !

Umkher layer	pmax	pmin	s(OmF)[ppmv]	<O3> [ppmv]	s/<O3> [%]
2	253.312	126.656	0.12	0.515	23.3
3	126.656	63.3281	0.21	1.38	15.3
4	63.3281	31.6641	0.25	2.97	8.4
5	31.6641	15.8320	0.21	4.19	5.0
6	15.8320	7.91602	0.24	5.17	4.6
7	7.91602	3.95801	0.24	5.83	4.1
8	3.95801	1.97900	0.29	5.20	5.6
9	1.97900	0.989502	0.28	3.92	7.1