

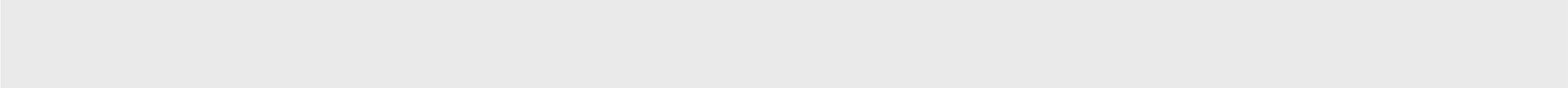
Comparison of Bogumil and Serdyuchenko cross-sections in the Chappuis bands.

Application to DOAS ground-based instruments

Manuel Gil (INTA)

presented by C. Lerot (BIRA-IASB)

ACSO meeting, 3-5 June 2013 (WMO)

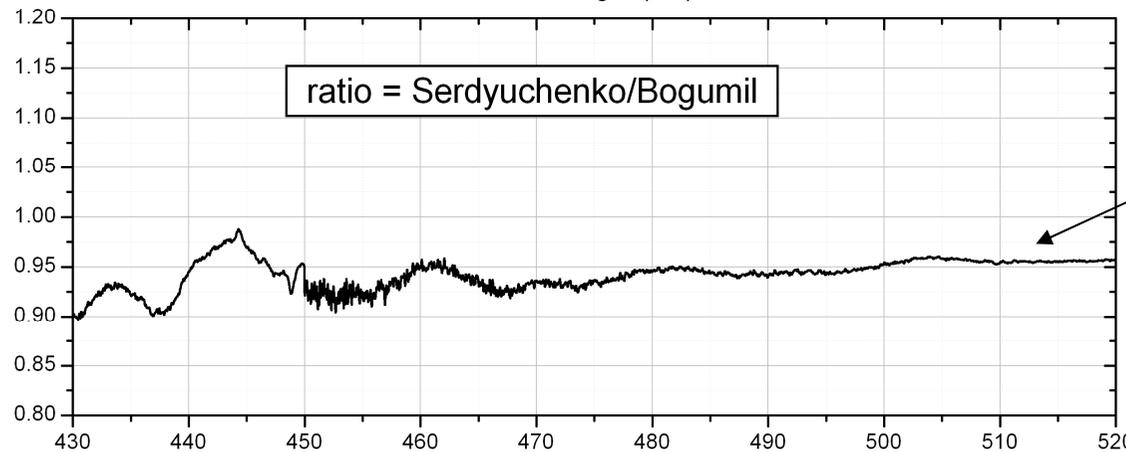
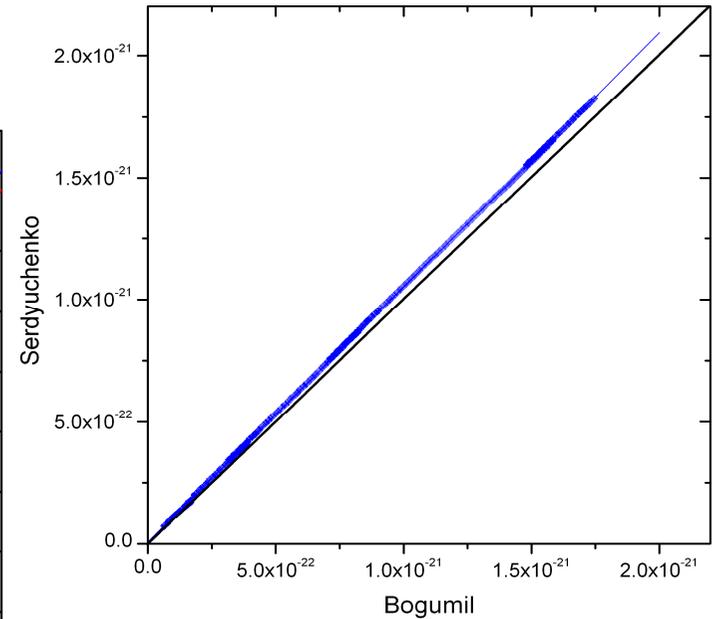
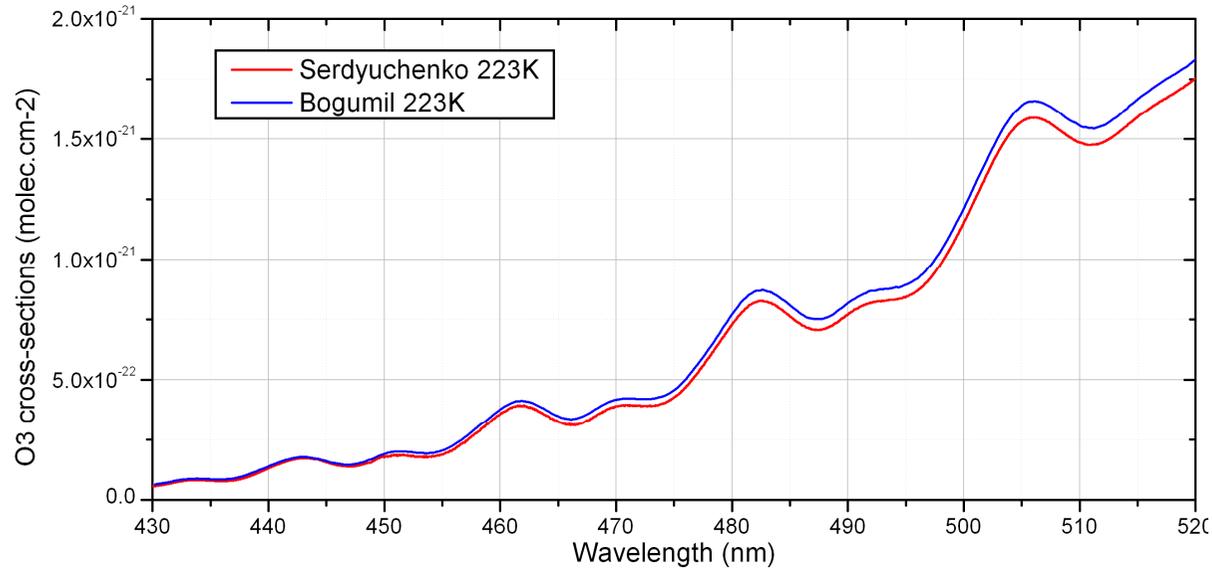


Serdyuchenko 223k & Bogumil 223K

Ozone in Chappuis: 430-520 nm range

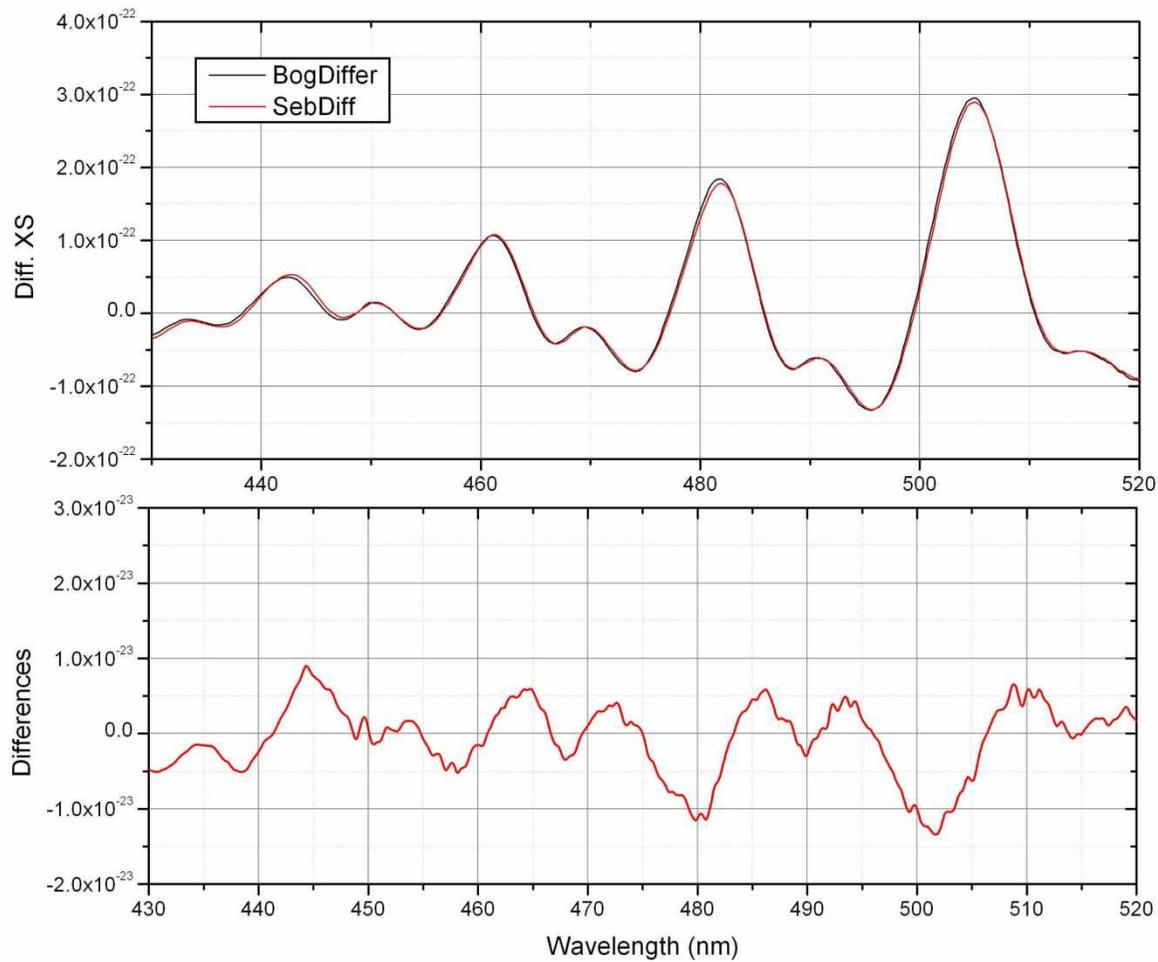
Bogumil XS resampled to Serdyuchenko

Direct comparison

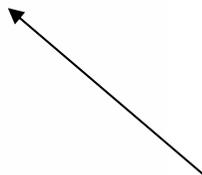


Differences in magnitude of absolute XS (4.4% lower than Bogumil)

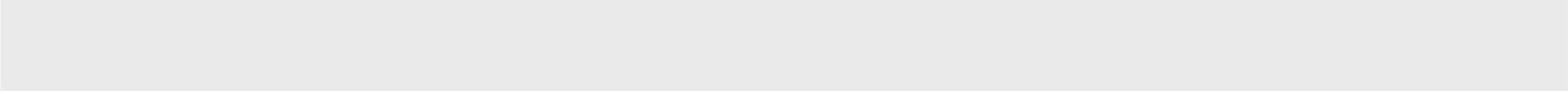
Differences in wavelength alignment. Less pronounced at longer wavelengths



Since DOAS make use of differential XS impact in retrieved values are lower -> 1.8% lower Serdy in standard deviation -> larger O3

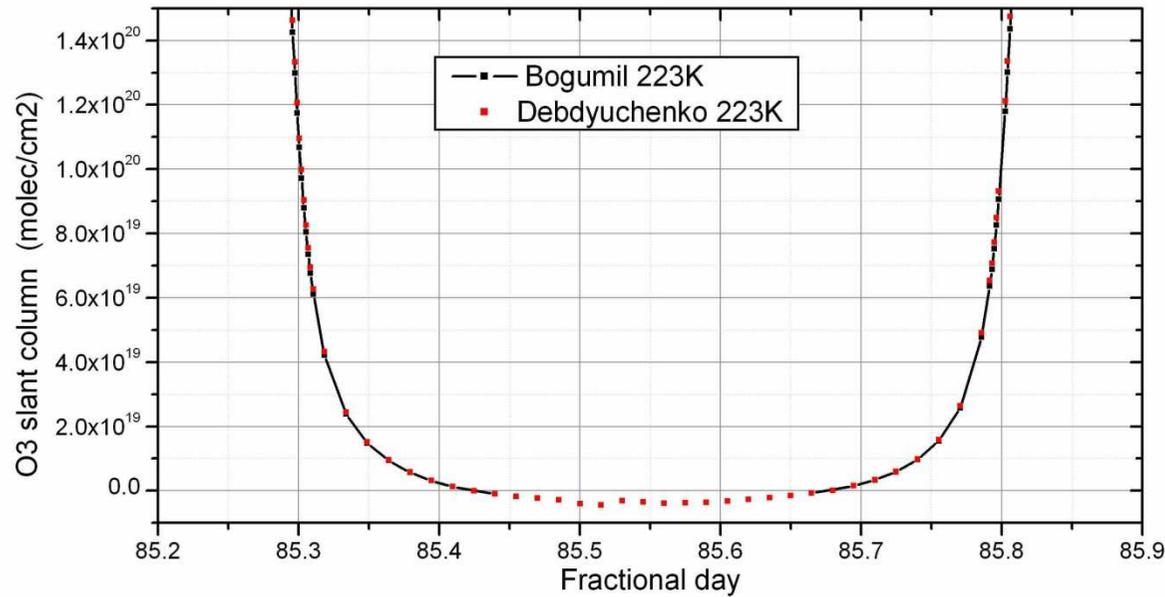


It seems that missalignment is mainly a shifting

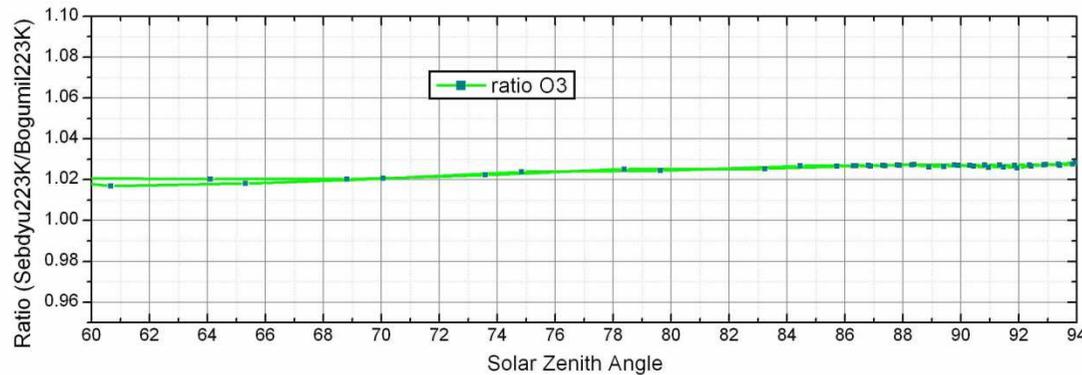


Day 085-2012
O3

Retrieved O3 slant column density

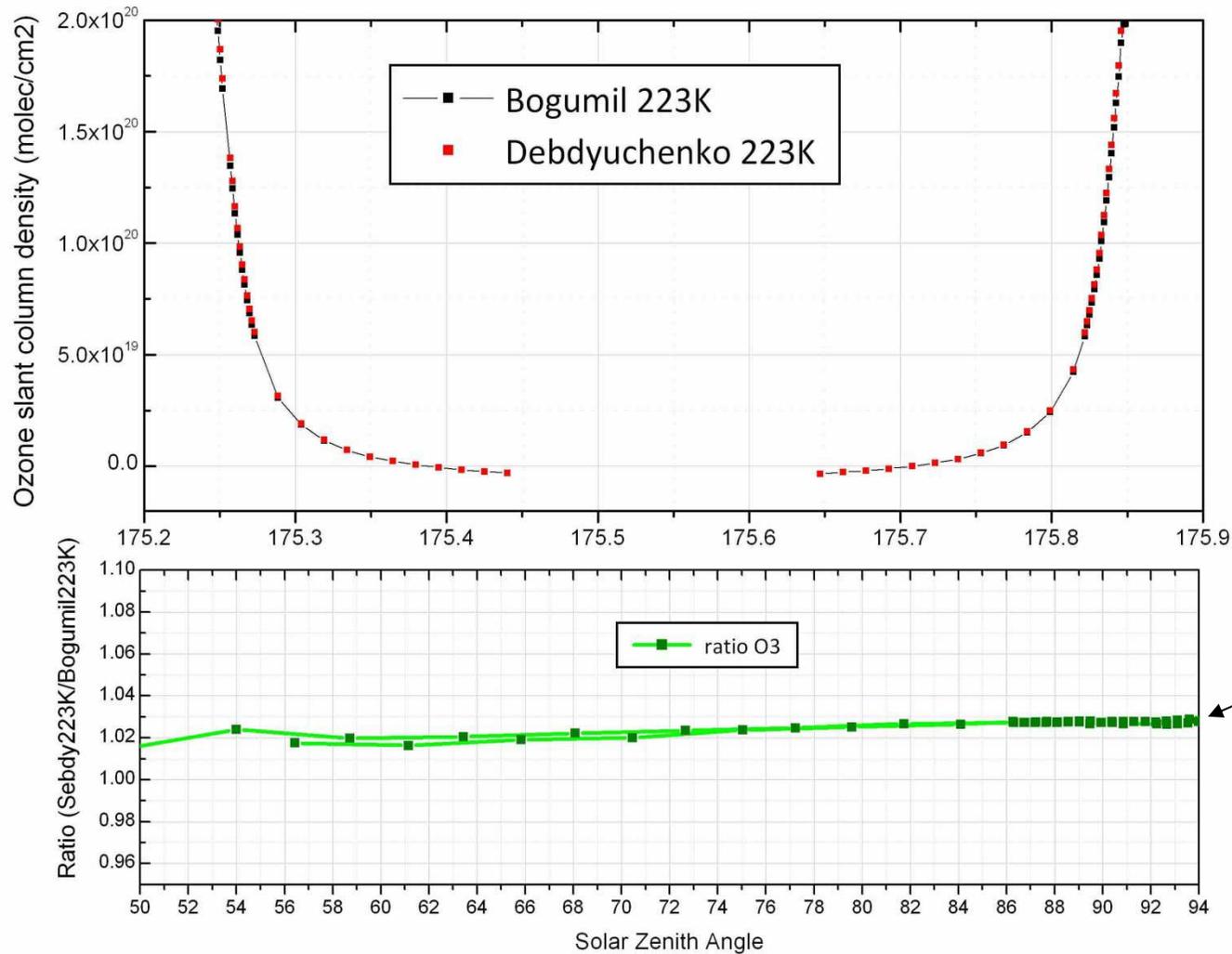


Actual measurements



Serdyuchenko 2.8% larger O3 columns than Bogumil in the selected range at twilight (measurement time for total columns)

Day 175-2012 O3



Test with a summer day yields identical results than previous one.

Serdyuchenko 2.8% larger O3 columns than Bogumil in the selected range at twilight (measurement time for total columns)

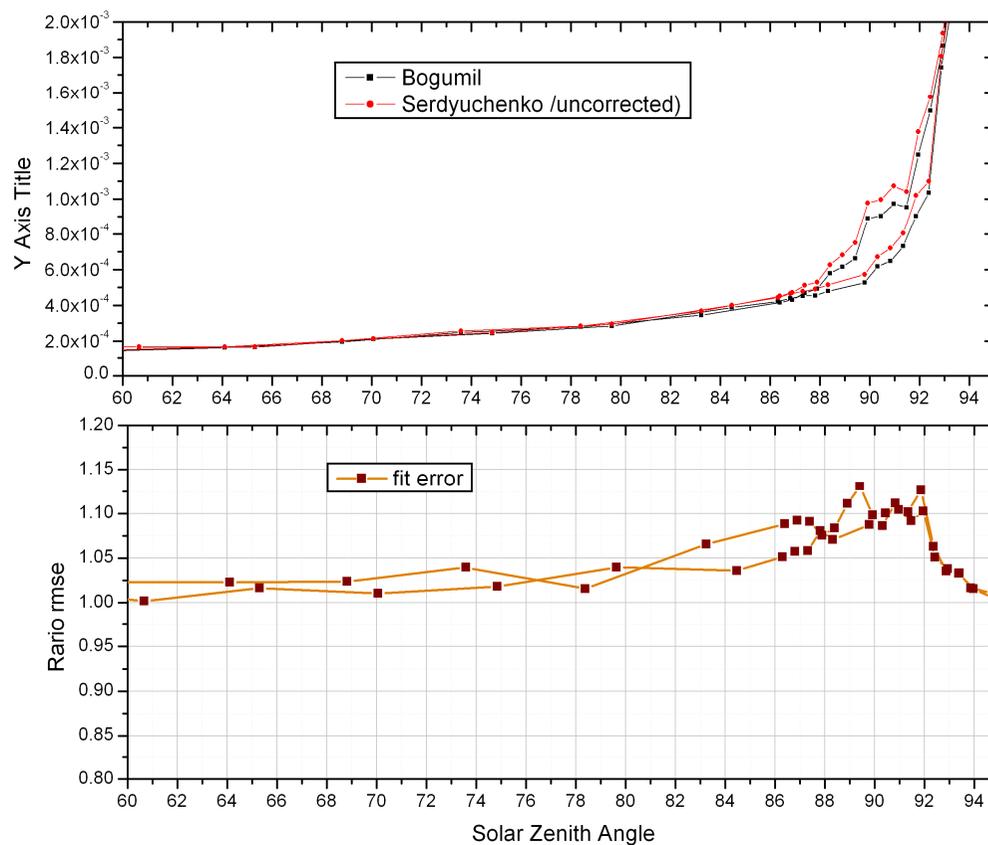
Serdyuchenko 223k & Bogumil 223K

Ozone in Chappuis: 430-520 nm range

Instrument resolution 0.7 nm

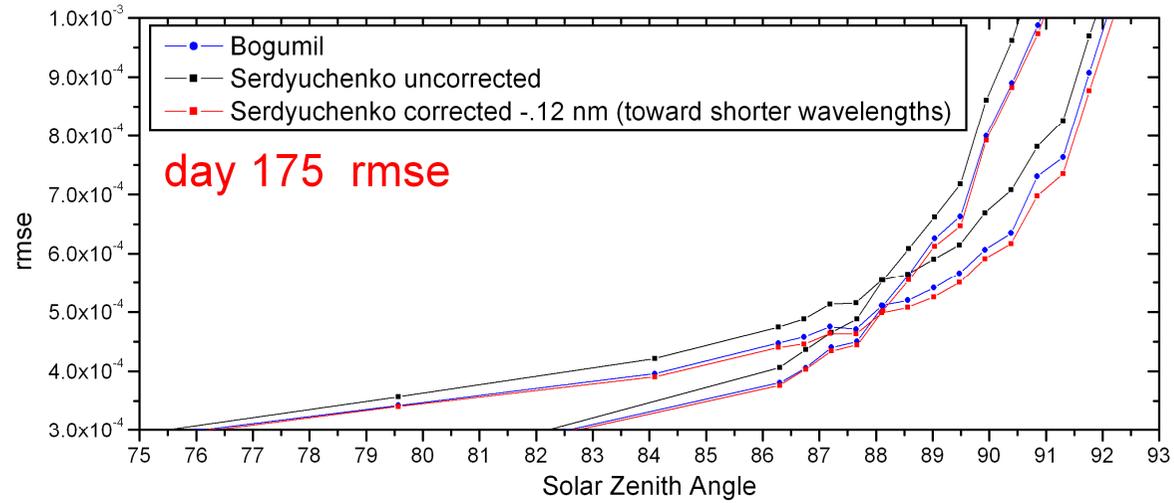
Day 085-2012

Fit errors

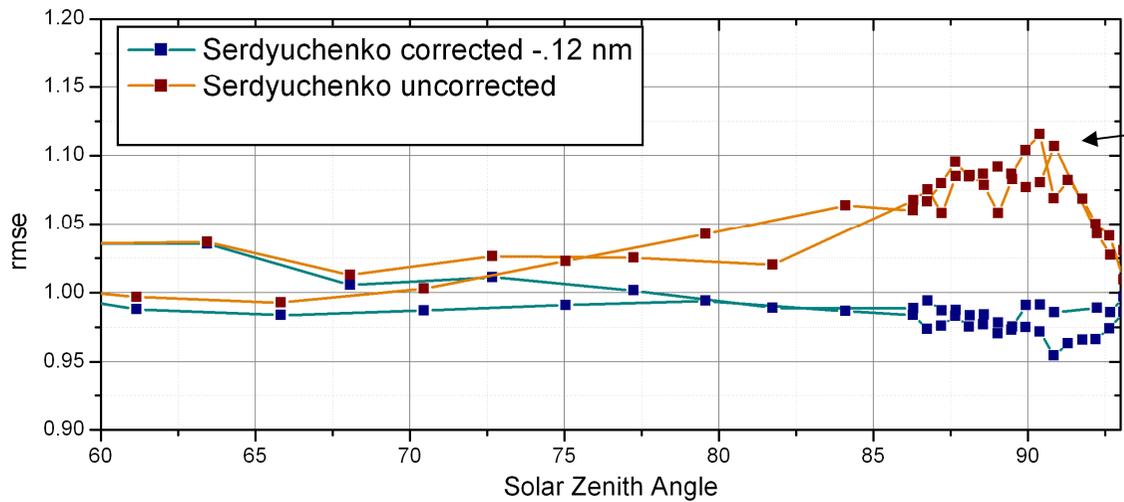


Serdyuchenko
(uncorrected) larger
fitting errors of 10%
in twilight

Day 175-2012 Fit errors



Errors effect for another day essentially the same as well,

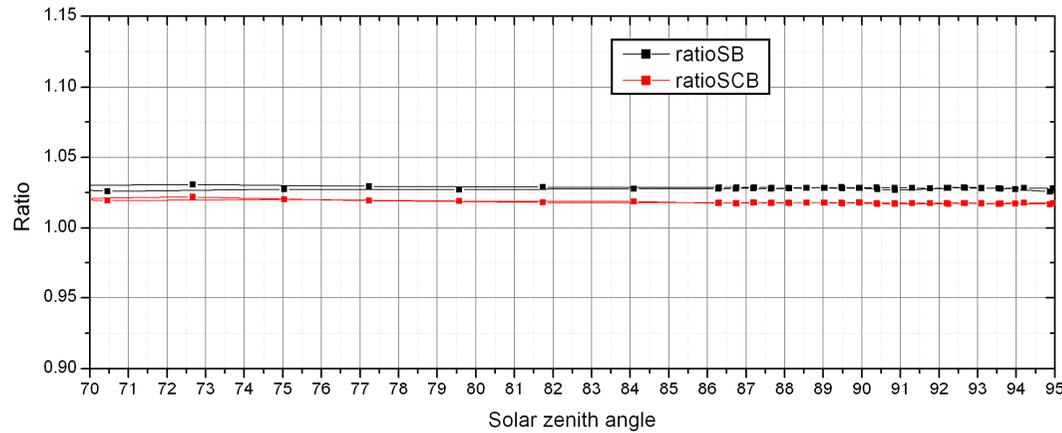
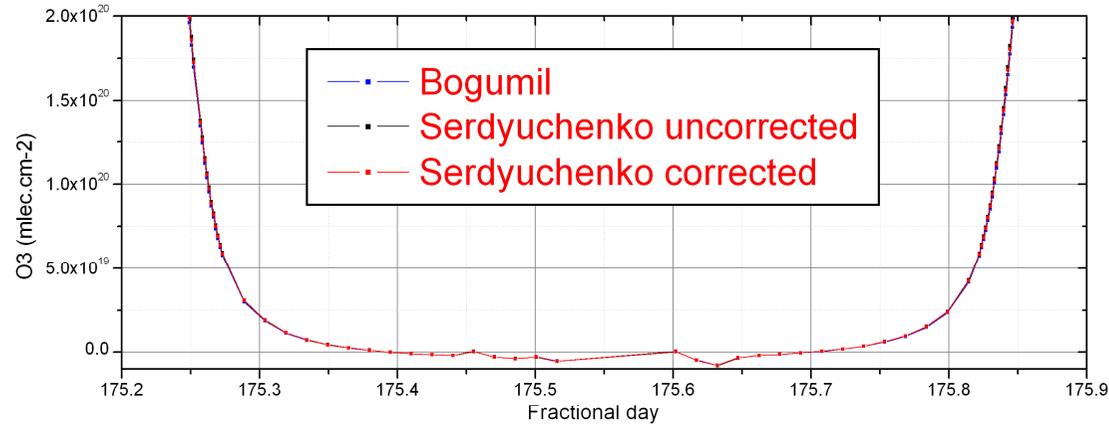


Serdyuchenko (uncorrected) larger fitting errors of 10% in twilight

After shifting 0.12-0.13 nm toward shorter wavelengths fit error improves

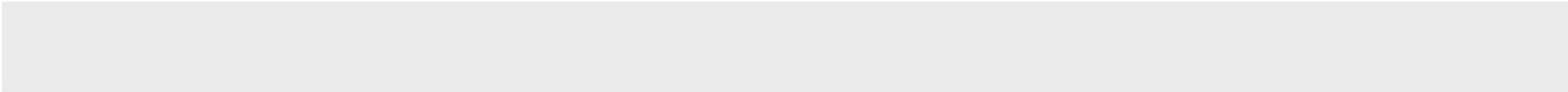
New analysis after shifting 0.12- nm toward lower wavelengths

Day 175-2012
O3



Without shifting
correction: 2.8 %
larger O3 retrieved
columns

After shifting 1.8 %
larger O3 retrieved
columns



Summary

- + A limited comparison test between the NDACC standard XS (Bogumil et al 223K) and the new XS Dubdyuchenko 223K have been done for the Chappuis band (430-520 nm). Bogumil XS standard in NDACC for the visible range
- + Serdyuchenko O3-XS are 4.4% larger in absolute values
- + There is a wavelength missalignment of 0.12-0.13 nm when compared to Bogumil 223K
- + Without shifting, new cross-sections provide an almost 3% larger O3 values than the Bogumil et al. 223K
- + Without shifting, fitting errors increase with the magnitude of the slant column. Errors 10% larger.
- + After 0.12 nm shifting toward shorter wavelengths, fitting errors slightly lower than Bogumil. Serdyuchenko still yields 1.8% larger O3 values.