

The effect of Serdyuchenko or BDM cross sections on ozone retrievals with OMI

Pepijn Veefkind, Albert Oude-Nijhuis and
Maarten Sneep

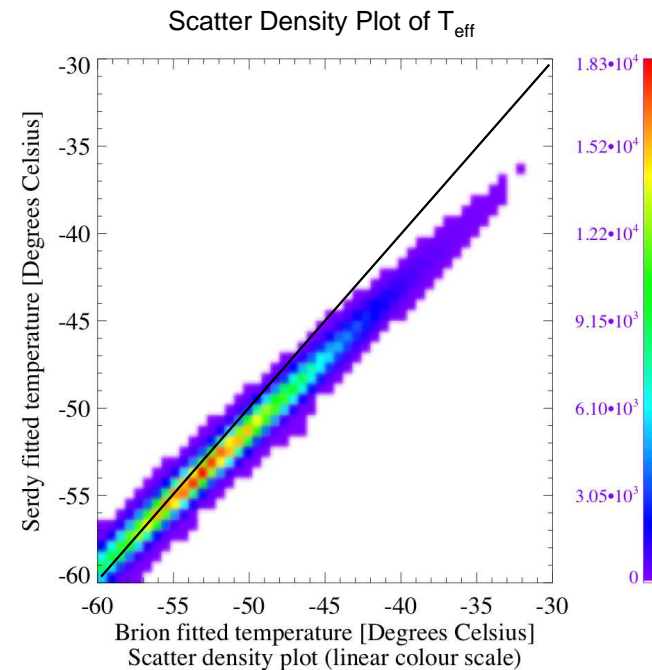
KNMI

OMI Total Ozone DOAS [OMDOAO3]

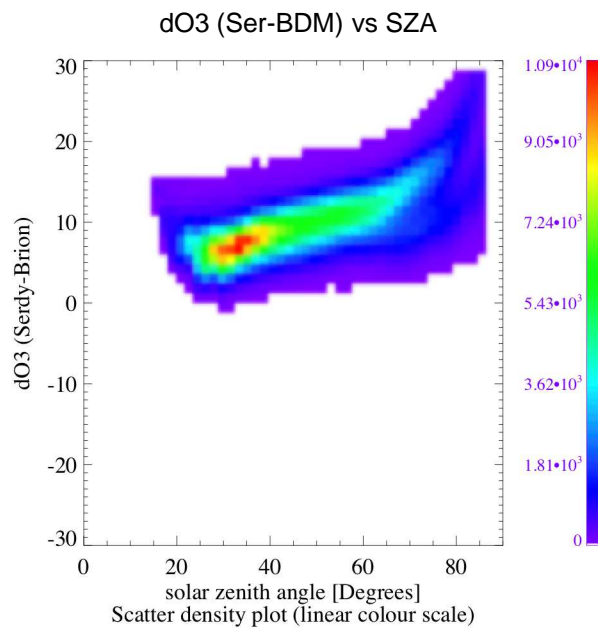
- Algorithm version 1.2.3
- Fit window 331.6 - 336.6
- Effective ozone temperature is fitted
- Default cross sections are BDM
- Comparison with Serdyuchenko cross sections
- Period 2005-10-1 (1.2 million points)
- Evaluated parameters are ozone difference and temperature difference

Regression Coefficients

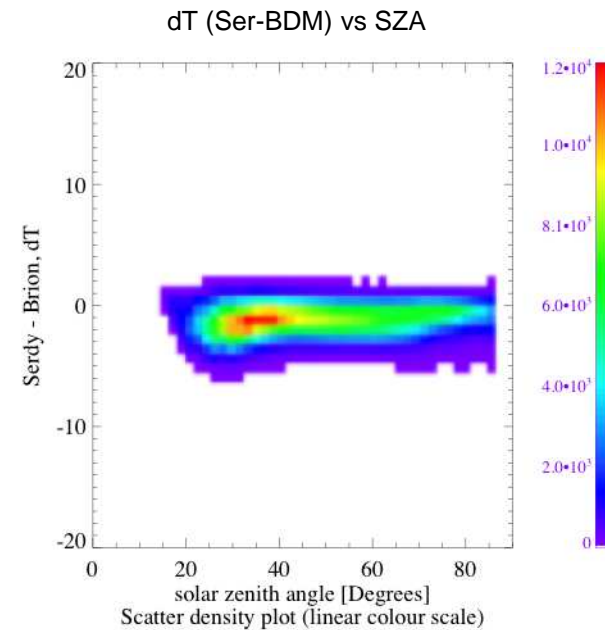
	Slope	Offset	Corr.
SCD BDM - SCD SER	1.01	1.36 DU	1.00
T_{eff} BDM - T_{eff} SER	0.81	-11 Deg C	0.99



OMI Total Ozone DOAS [OMDOAO3]



Serdyuchenko gives 7 DU higher results in the tropics. At 70 deg SZA the difference is ~15 DU.

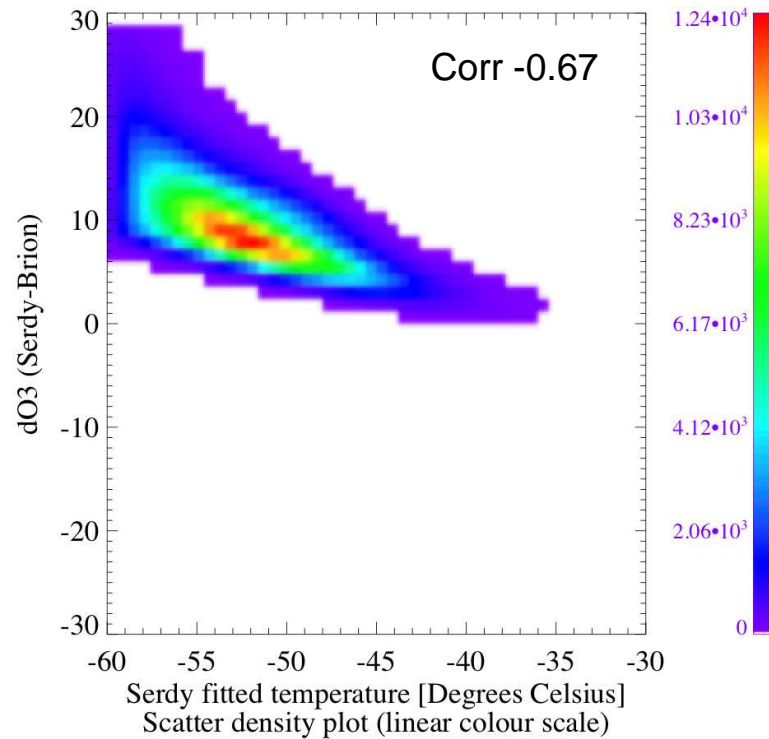


Temperature difference does not show significant SZA dependence.

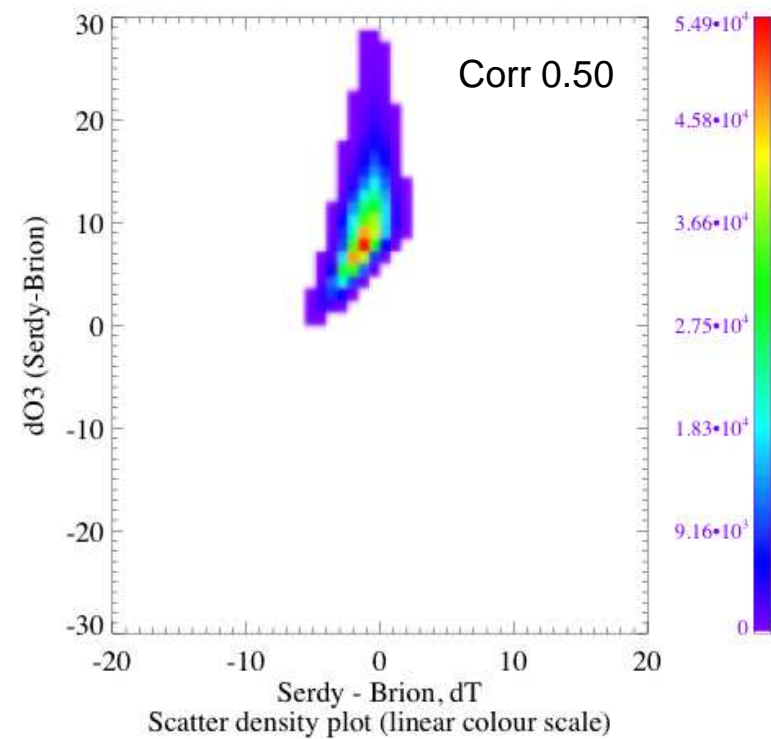
	Mean	Std
SCD SER - SCD BDM	10.7 DU	4.38 DU
$T_{\text{eff}}^{\text{SER}} -$ $T_{\text{eff}}^{\text{BDM}}$	-0.84 Deg C	-1.18 Deg C

OMI Total Ozone DOAS [OMDOAO3]

dO3 (Ser-BDM) vs Tef



dT (Ser-BDM) vs SZA

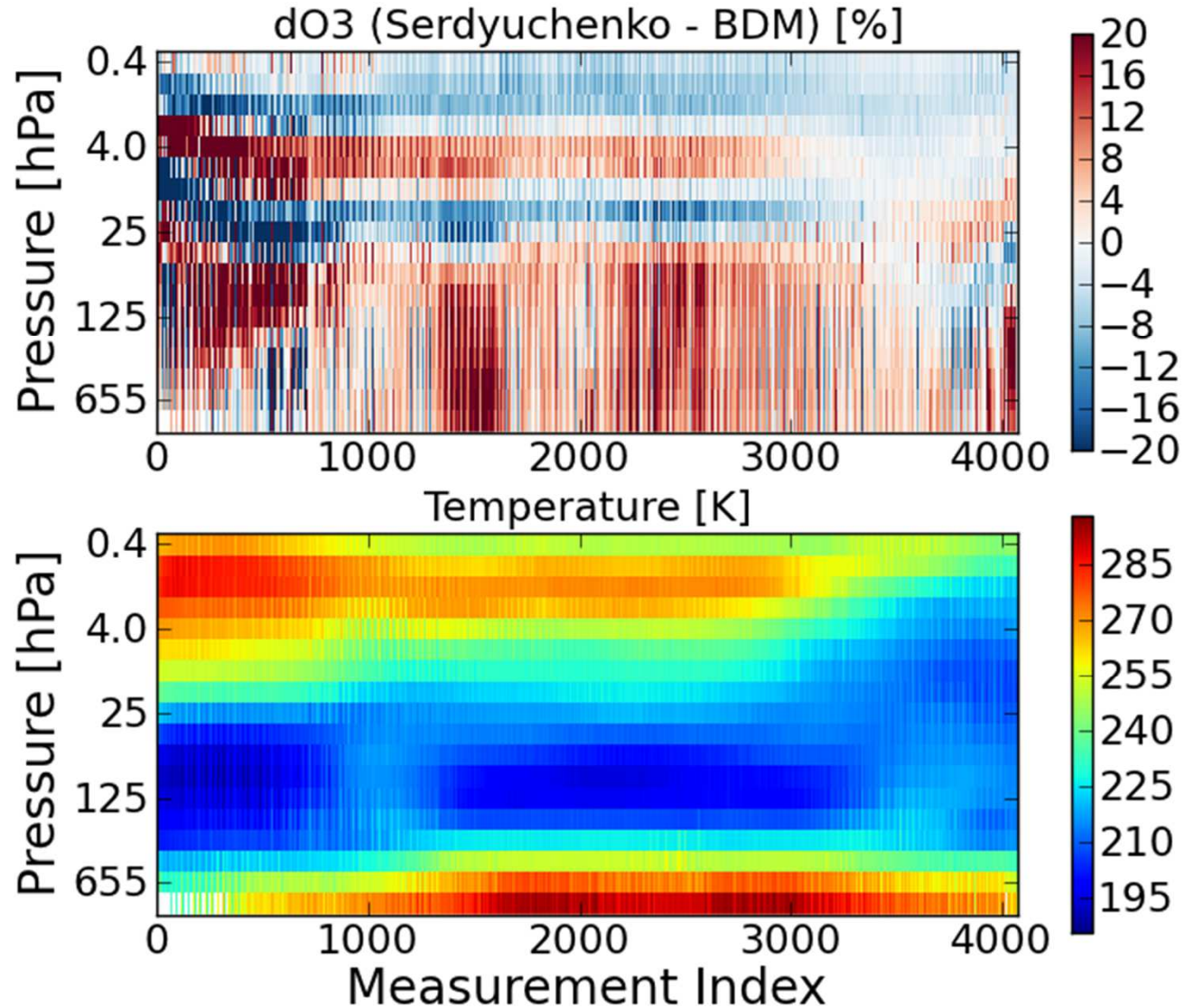


OMI Ozone Profile [OMPRO3]

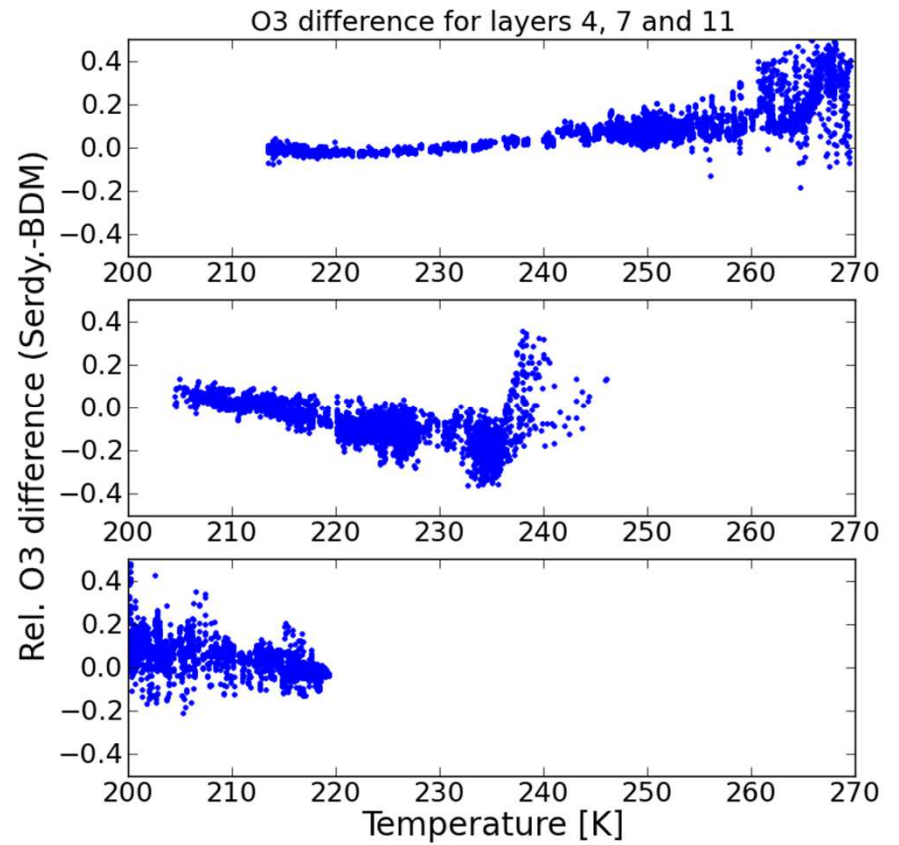
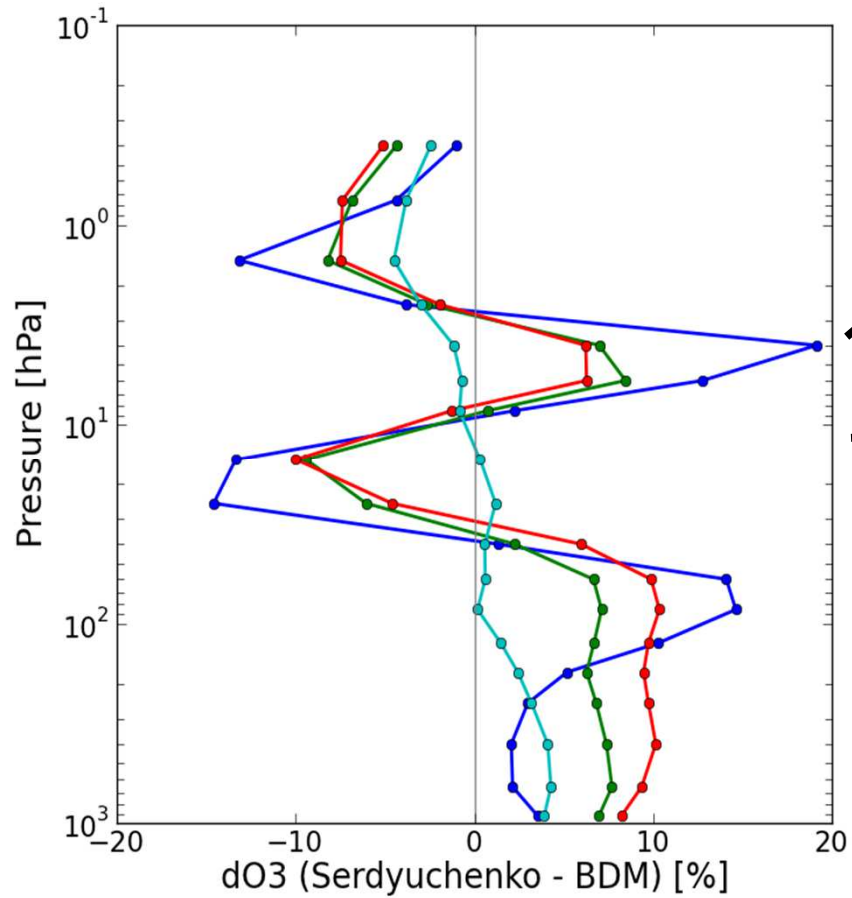
- Algorithm version 1.1.1
- Fit window 270 - 330 nm
- Default cross sections are BDM
- Comparison with Serdyuchenko cross sections
- Period 2005-10-18 orbit 6704, stride 10 (4073 points)
- Temperatures from ECMWF

	Serdyuchenko	BDM
Number of Iterations	3.41	3.44
Reflectance Cost Function	2.7 (1.8)	11.6 (1.9)
DFS	5.0	4.9

OMI Ozone Profile [OMPRO3]



OMI Ozone Profile [OMPRO3]



Conclusions

OMDOAO3

- Serdyuchenko give 3-4% larger ozone columns
- Difference is SZA dependent
- Effective temperatures comparable

OMO3PR

- Convergence and fitting diagnostics are similar
- Up to 20% differences in ozone
- Differences show oscillations with pressure
- For some layers the differences correlate with the temperature

From these results it is not to come to a recommendation on which cross sections to use

Recommendation to harmonize the second order polynomial coefficients