

Supplement of Atmos. Chem. Phys., 19, 13647–13679, 2019
<https://doi.org/10.5194/acp-19-13647-2019-supplement>
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Supplement of

Technical note: Reanalysis of Aura MLS chemical observations

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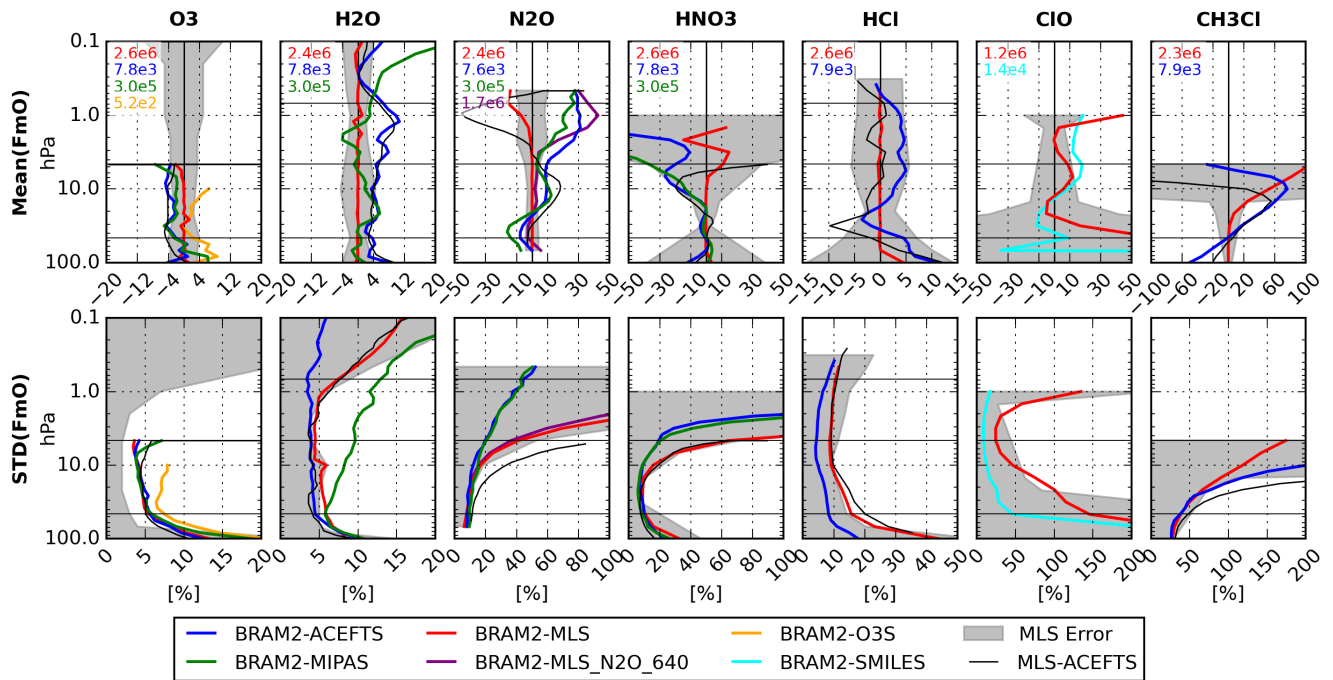


Figure S1. As Fig. 5 but between 60°S-30°S.

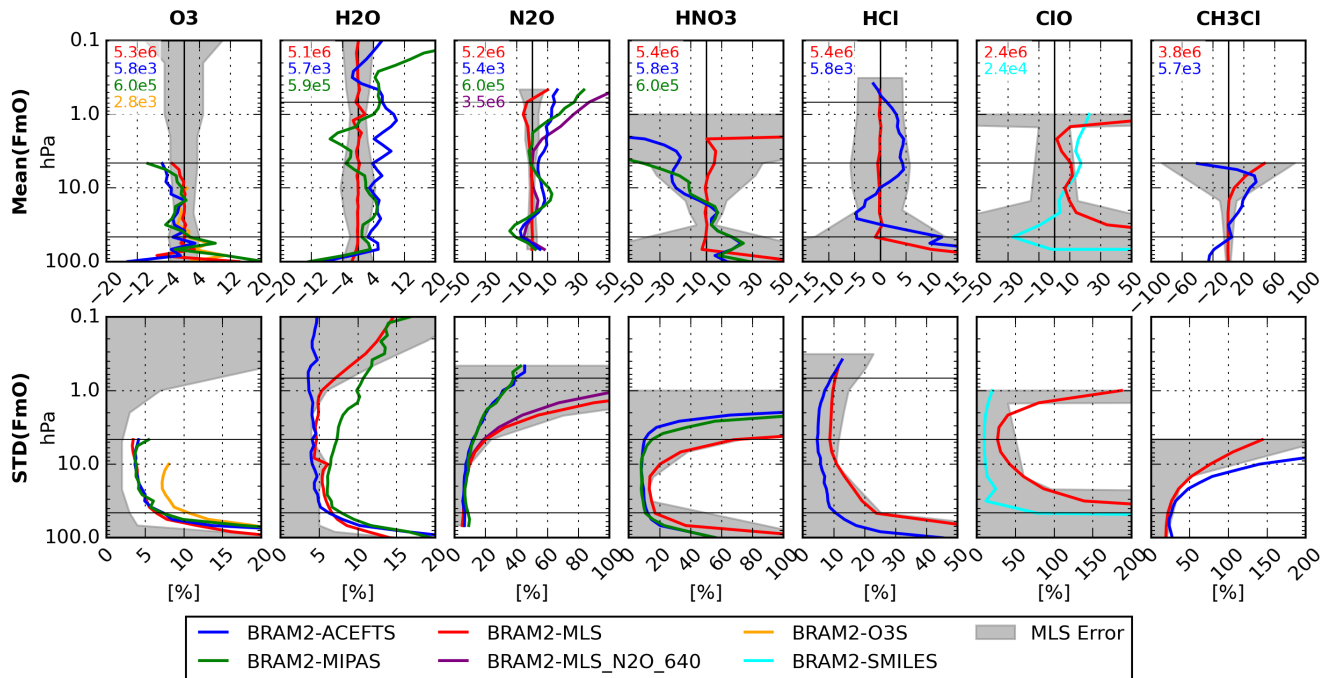


Figure S2. As Fig. 5 but between 30°S-30°N.

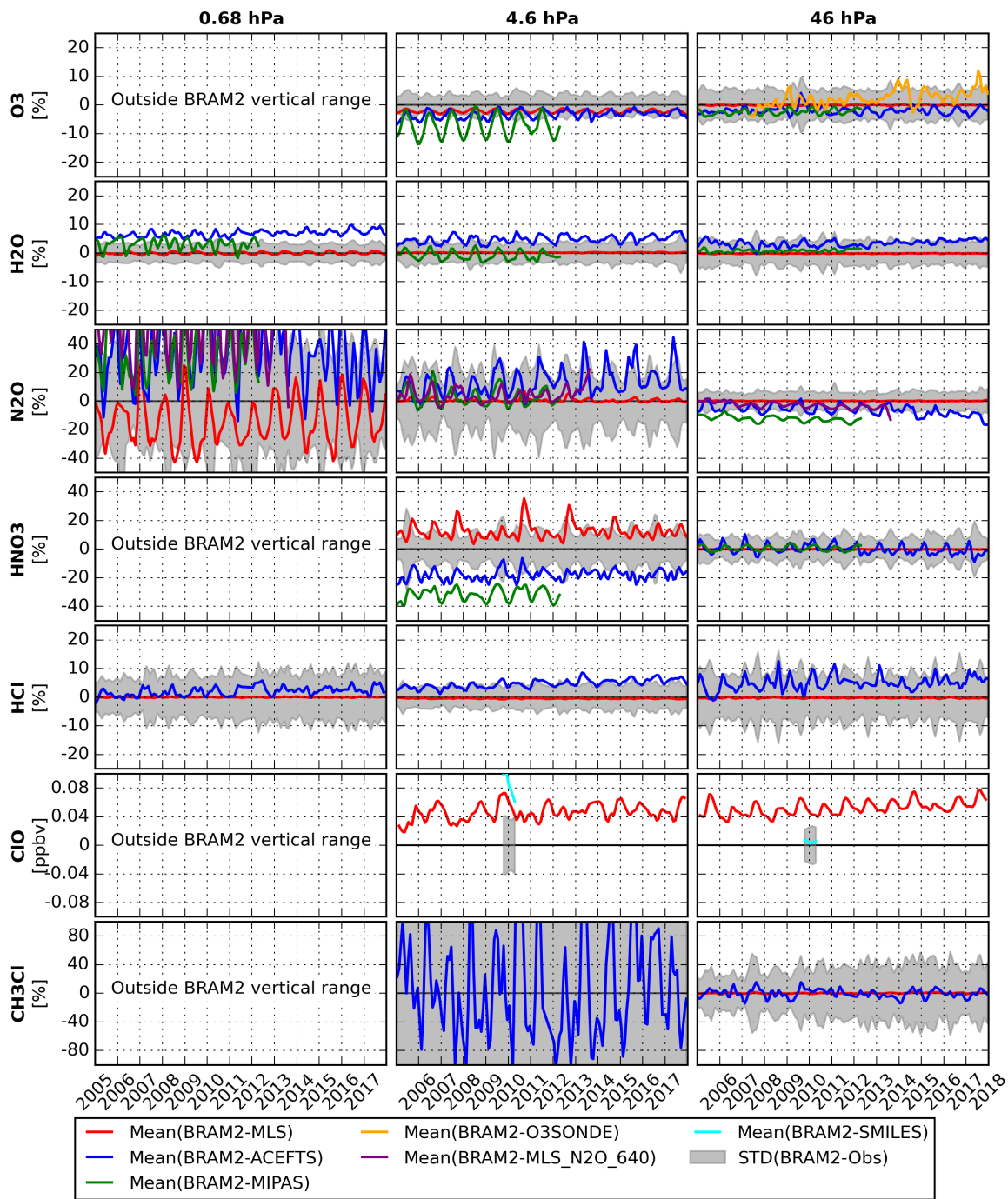


Figure S3. As Fig. 6 but between 60°S-30°S.

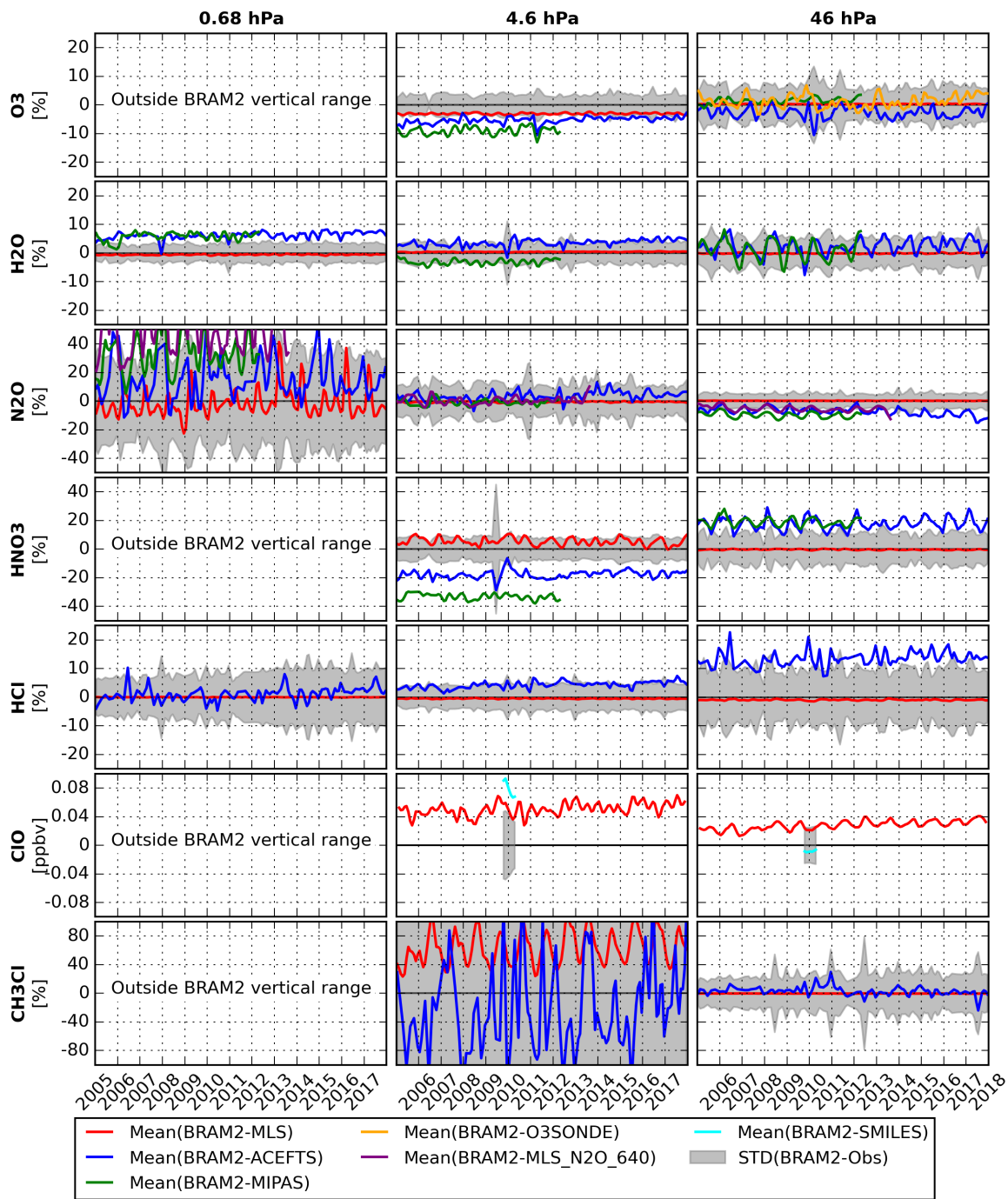


Figure S4. As Fig. 6 but between 30°S-30°N.

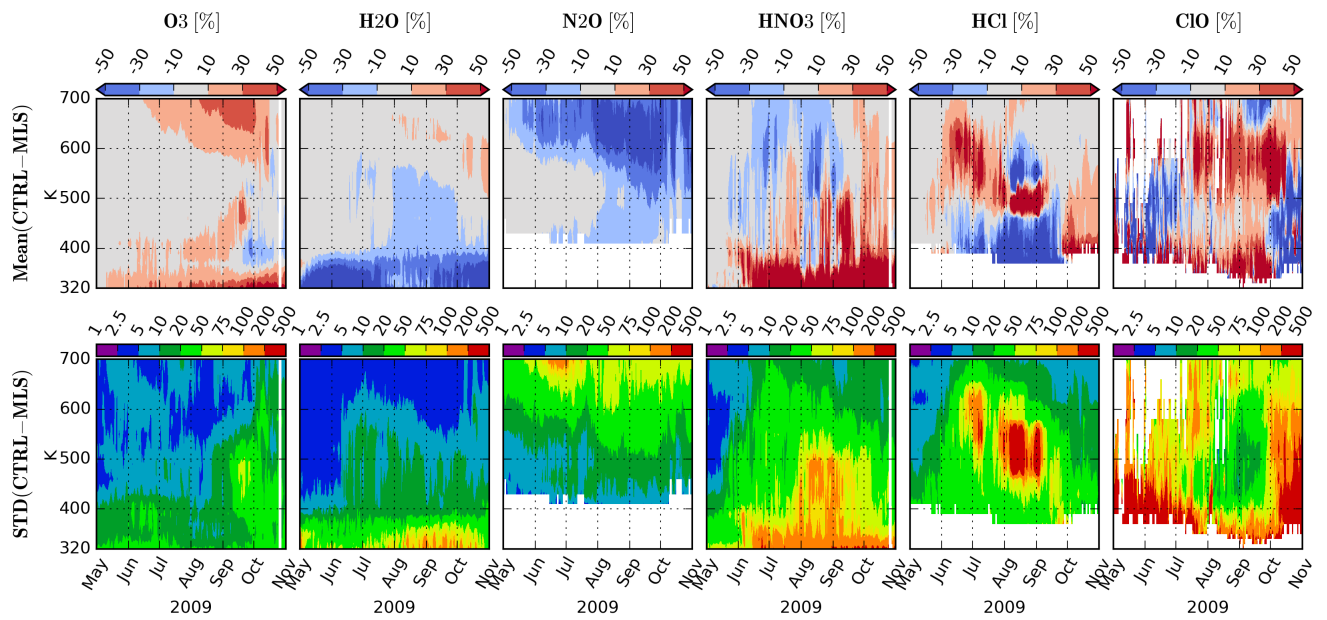


Figure S5. Mean (top) and standard deviations (bottom) of the difference (CTRL-MLS) for the conditions shown in Fig. 7.

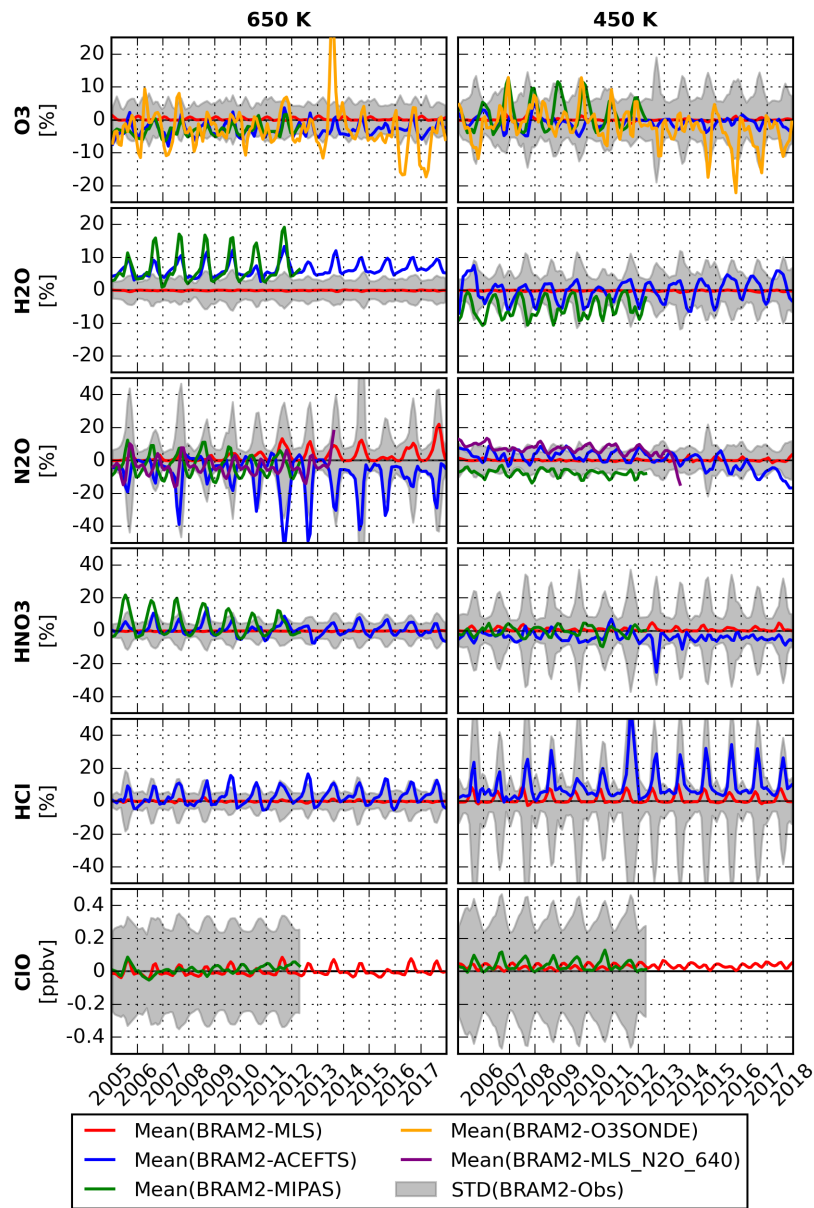


Figure S6. As Fig. 8 but in the outer Antarctic polar vortex between (75°S-60°S of equivalent latitude).

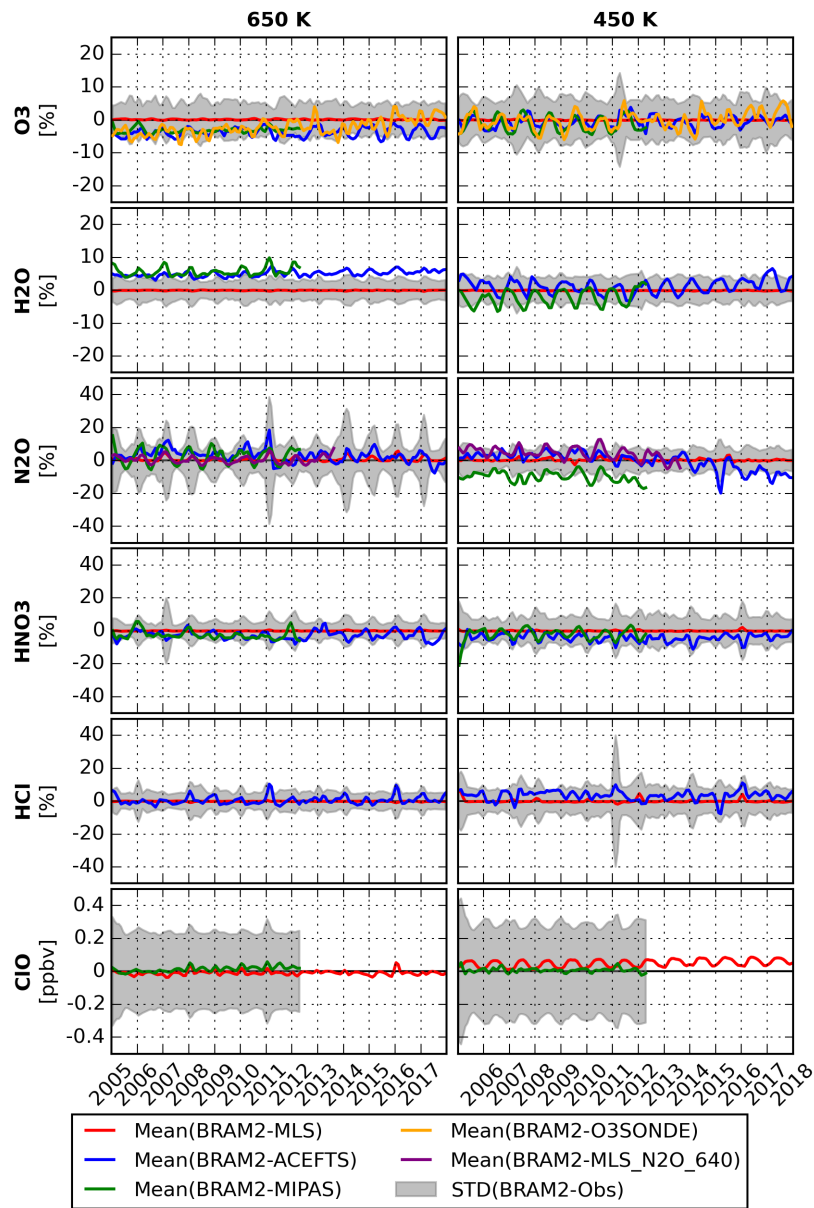


Figure S7. As Fig. 8 but in the outer Arctic polar vortex between (60°N - 75°N of equivalent latitude).

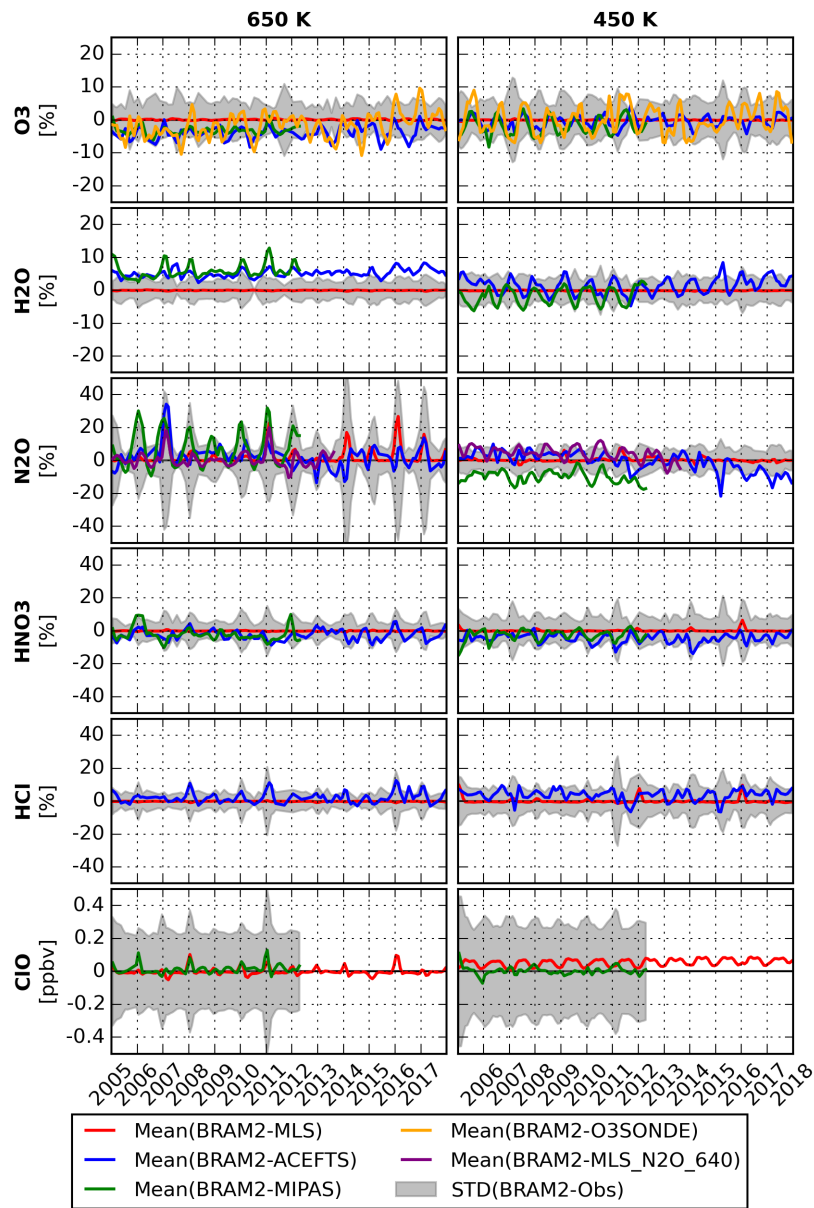


Figure S8. As Fig. 8 but in the outer Arctic polar vortex between (75°N-90°N of equivalent latitude).

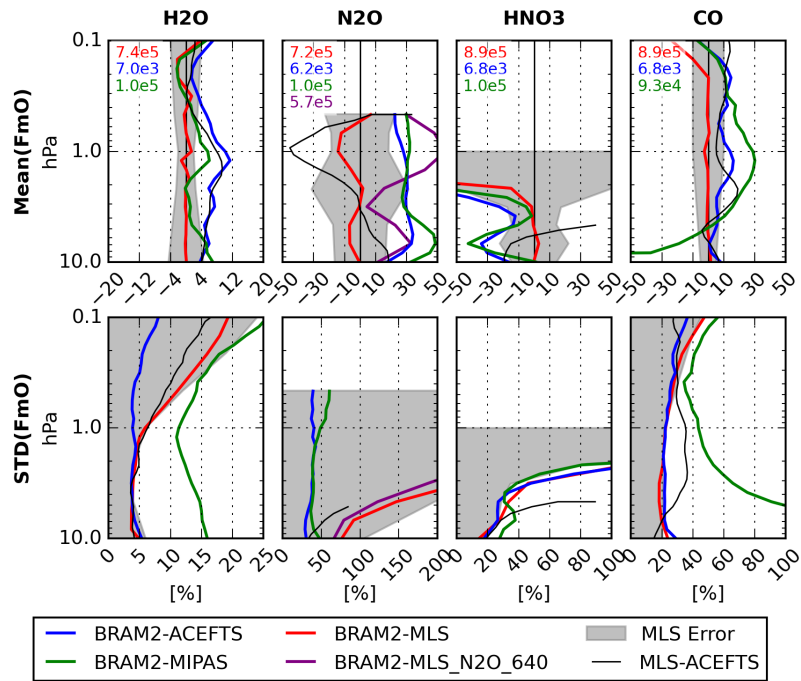


Figure S9. As Fig. 10 but between 90°S-60°S.

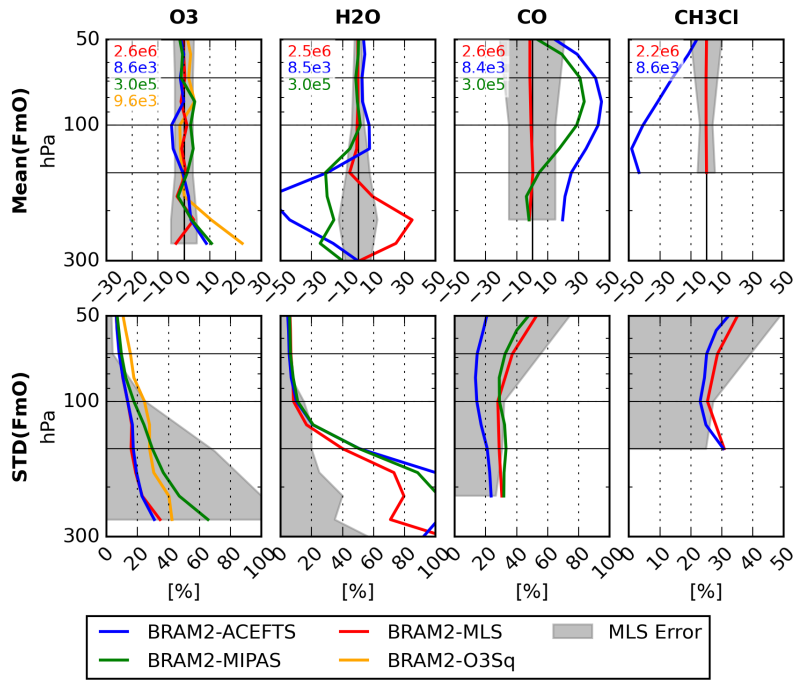


Figure S10. As Fig. 12 but between 30°N-60°N.

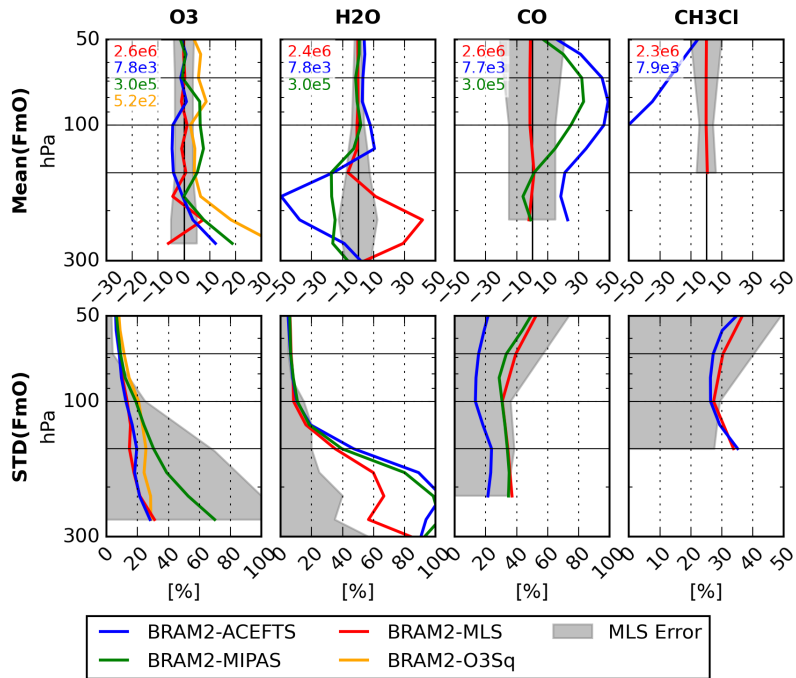


Figure S11. As Fig. 12 but between 60°S-30°S.

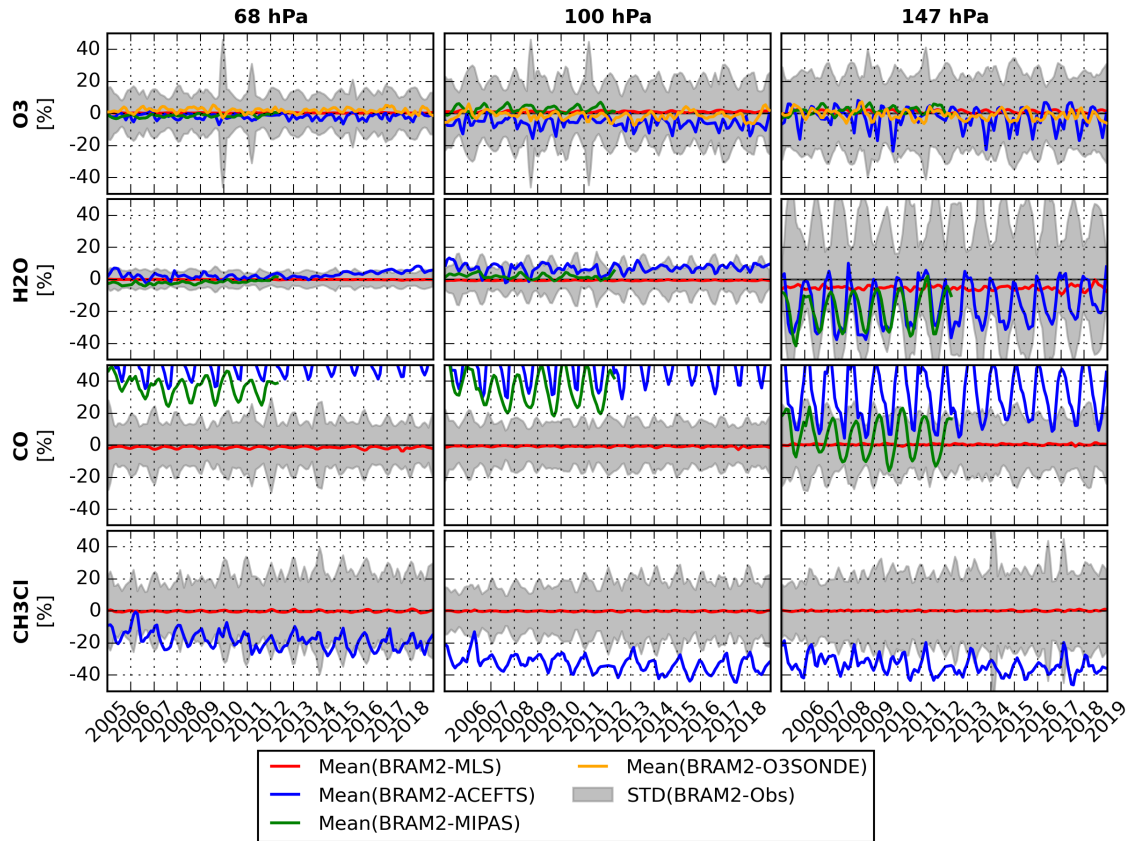


Figure S12. As Fig. 12 but between 30°N-60°N.

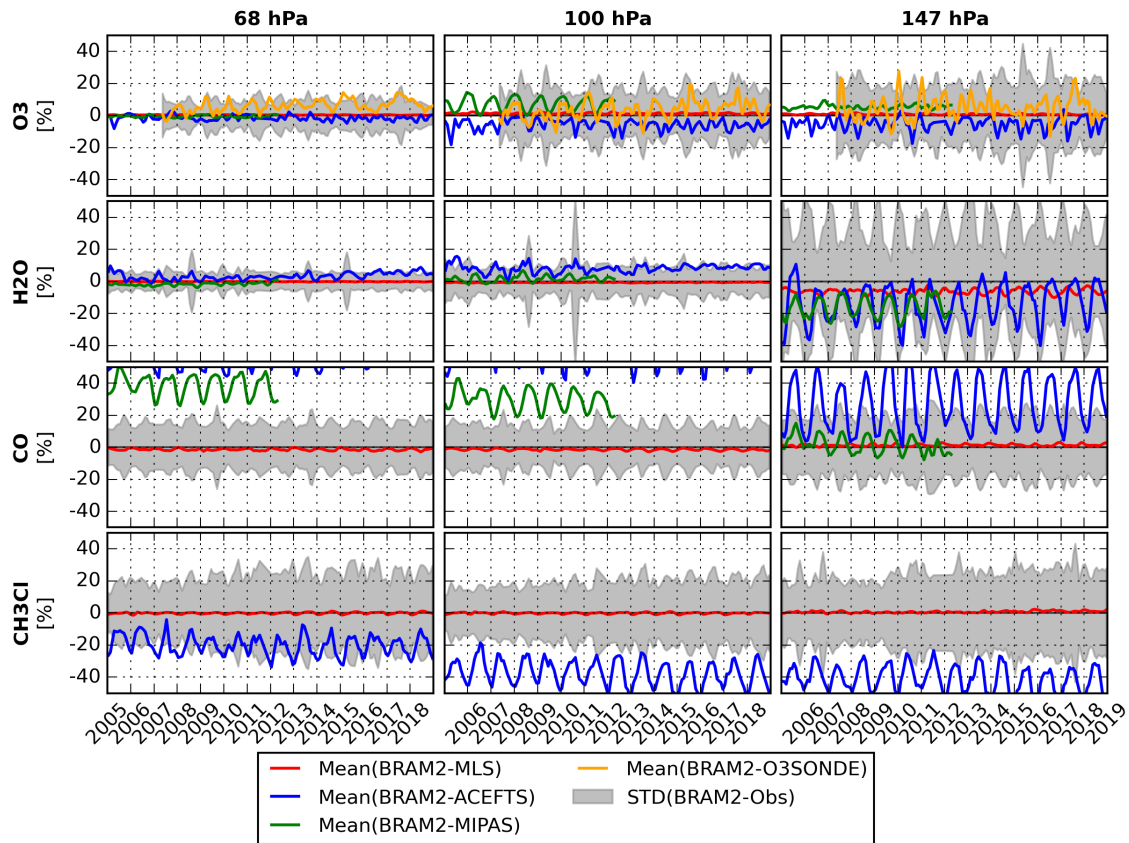


Figure S13. As Fig. 13 but between 60°S-30°S.

Table S1. Mean difference and standard deviation between BRAM2 and observations for the 2005-2017 period at three typical levels in the ex-UTLS: 68, 100 and 147 hPa. Values are in %, normalized by BRAM2. Abbreviations: Not Assimilated (N. A.).

Species	Instruments	68 hPa	100hPa	147 hPa
O ₃	MLS	0 ± 8 %	1 ± 13 %	1 ± 16 %
	ACE-FTS	-2 ± 8 %	-5 ± 13 %	-1 ± 17 %
	MIPAS	-1 ± 9 %	4 ± 17 %	1 ± 30 %
	O3sondes	2 ± 15 %	-2 ± 25 %	-1 ± 28 %
H ₂ O	MLS	0 ± 7 %	-1 ± 8 %	-5 ± 40 %
	ACE-FTS	2 ± 6 %	7 ± 10 %	-20 ± 50 %
	MIPAS	-2 ± 6 %	1 ± 11 %	-20 ± 50 %
CO	MLS	-1 ± 35 %	-1 ± 28 %	0 ± 29 %
	ACE-FTS	40 ± 14 %	42 ± 14 %	25 ± 22 %
	MIPAS	30 ± 33 %	30 ± 28 %	5 ± 33 %
CH ₃ Cl	MLS	0 ± 30 %	0 ± 25 %	0 ± 30 %
	ACE-FTS	-20 ± 25 %	-40 ± 23 %	-45 ± 30 %