

Comparisons with Observations

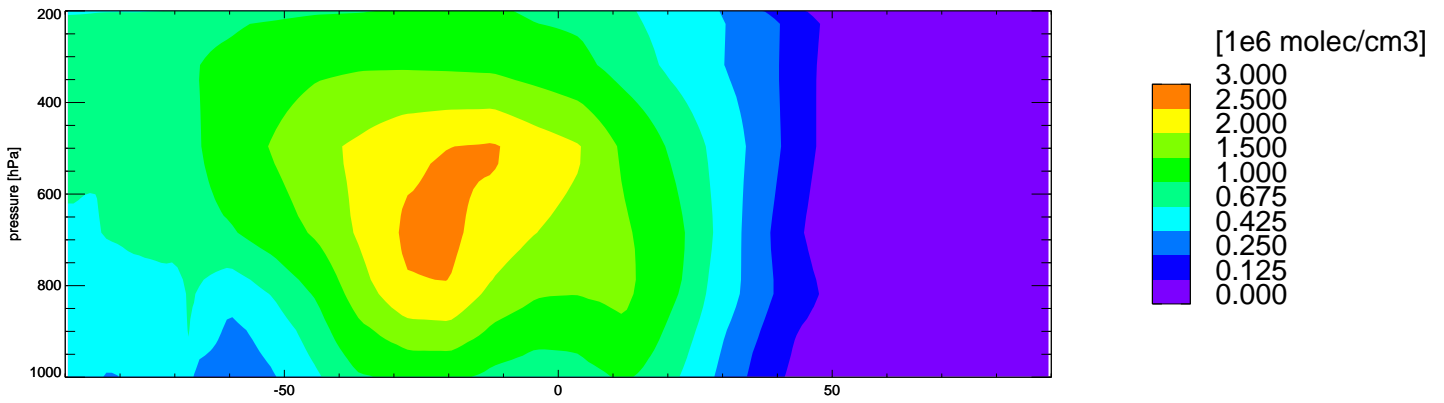
Ph. Le Sager

March 25, 2014

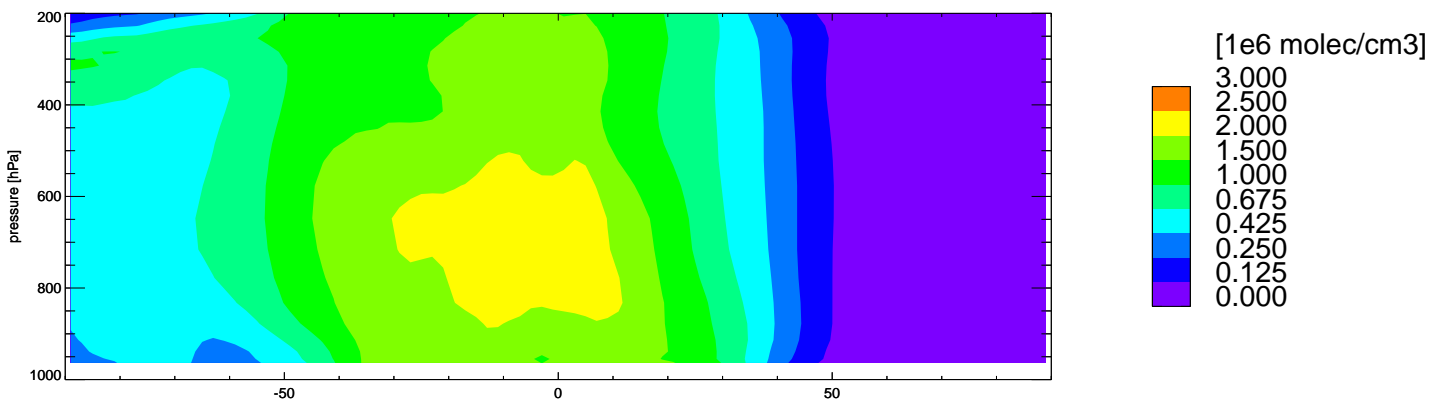
- OH comparisons (Spivakovsky, Hohenpeissenberg)
- O₃ comparisons (MOZAIC, CMDL, Sondes)
- CH₂O comparisons (SCIAMACHY)
- CO comparisons (MOPITT, CMDL, MOZAIC)
- NO₂ comparisons (OMI)

OH comparisons (Spivakovsky, J(O1D)@Hohenpeissenberg)

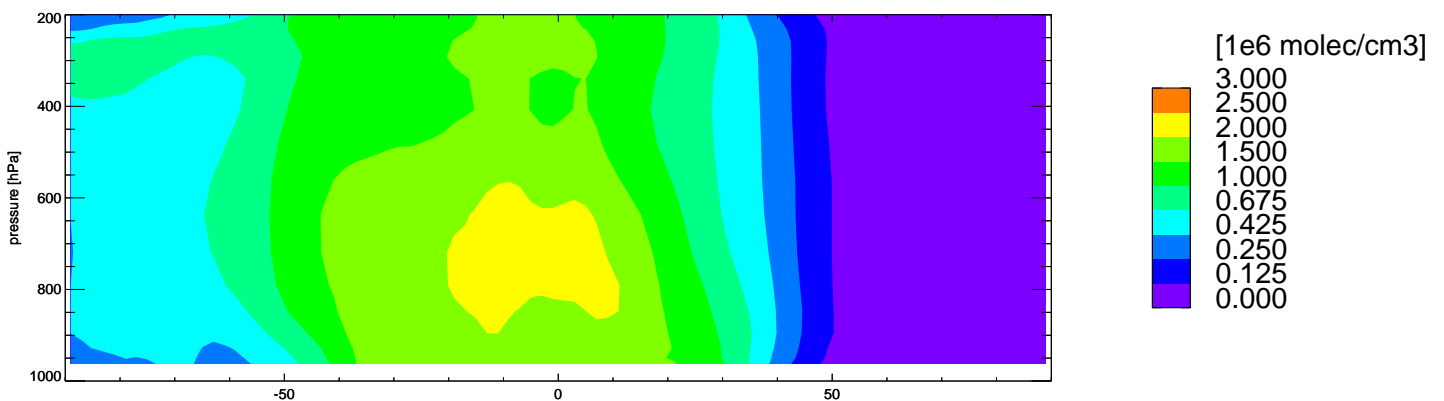
Spivakovsky OH - Jan 2006



TM5 eral OH - Jan 2006

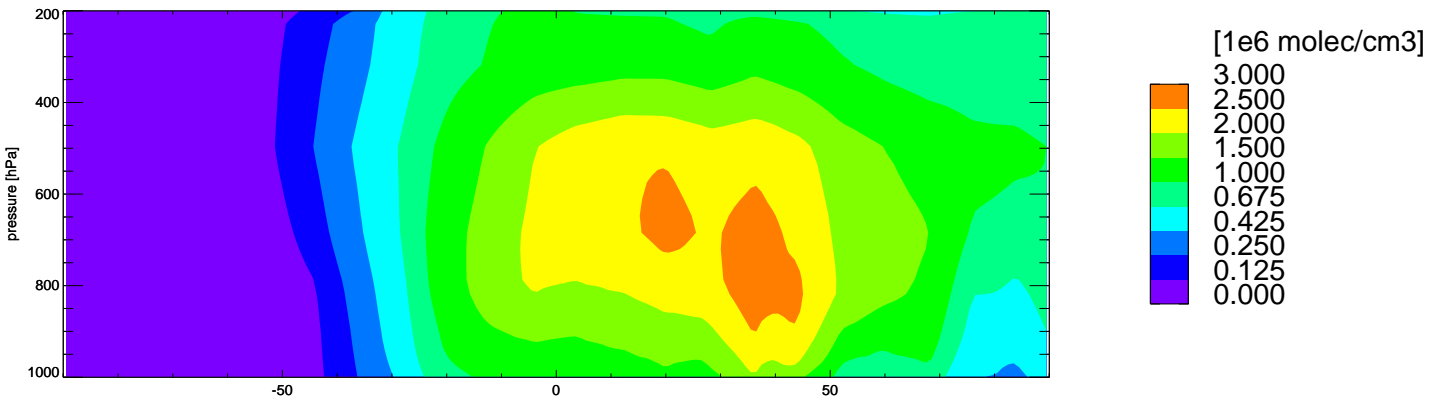


TM5 era5 OH - Jan 2006

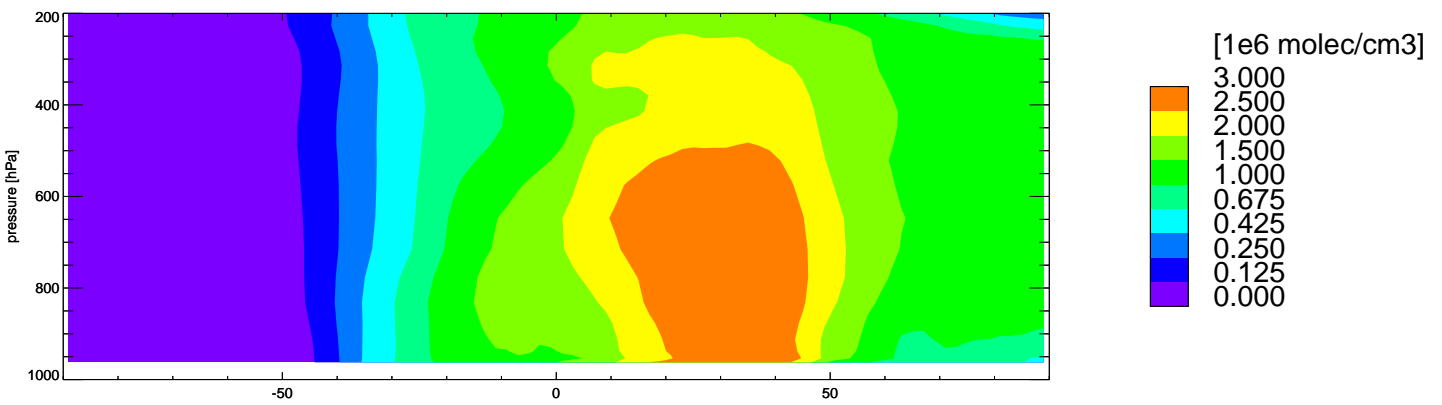


Zonal monthly mean OH concentrations for JANUARY 2006, from climatological average of Spivakovsky (top), and as simulated by the TM5 models.
Note: Spivakovsky is 8% too high on average.

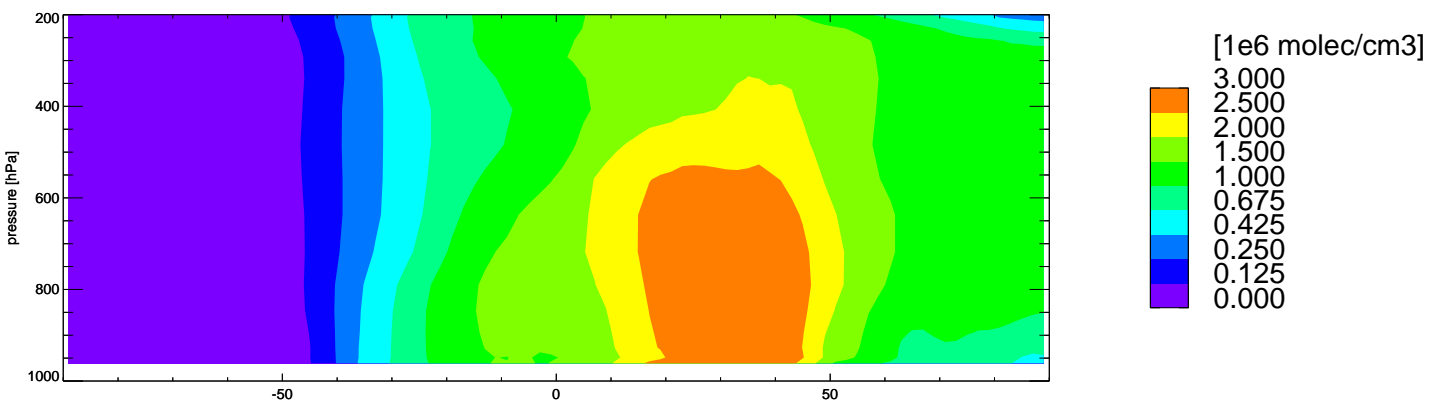
Spivakovsky OH - July 2006



TM5 eral OH - July 2006

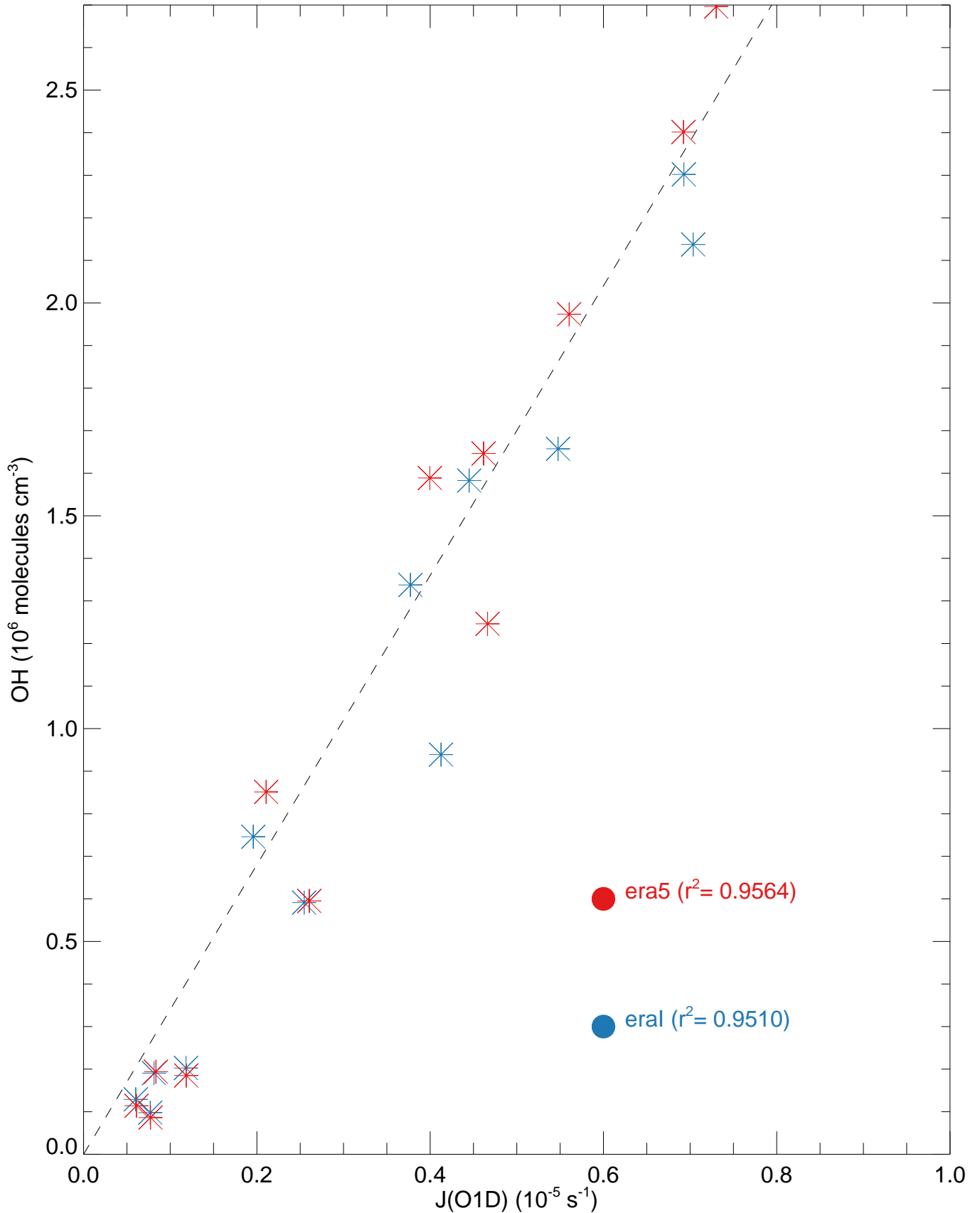


TM5 era5 OH - July 2006



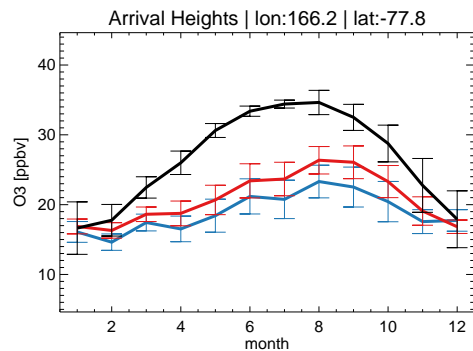
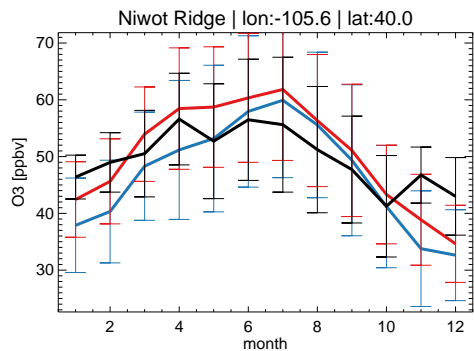
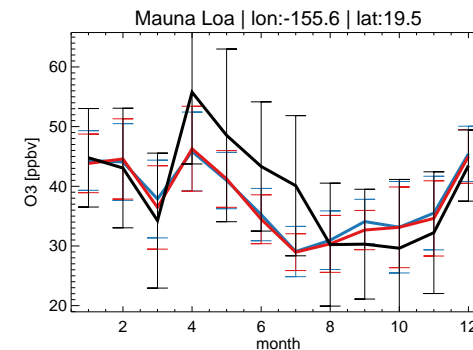
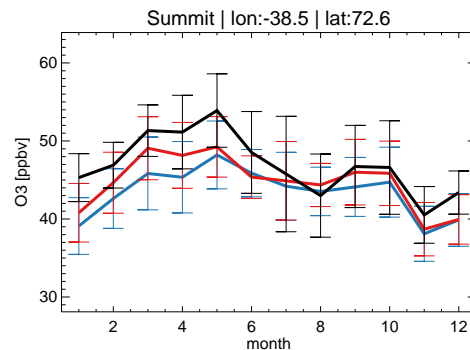
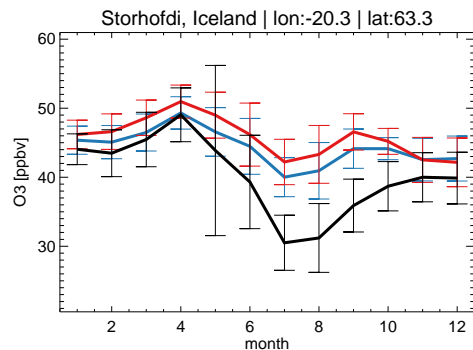
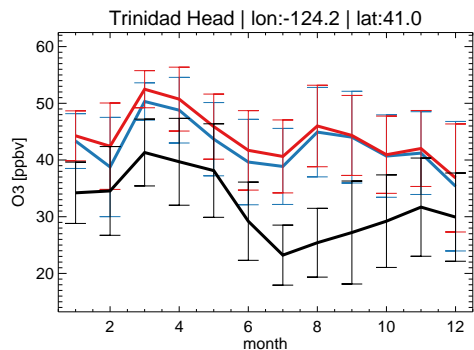
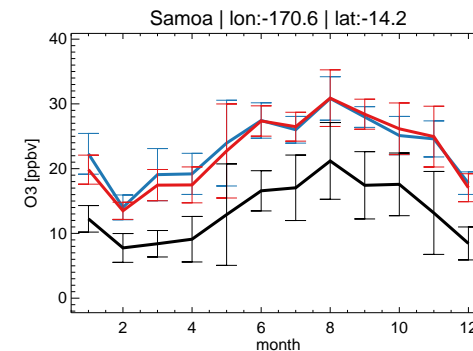
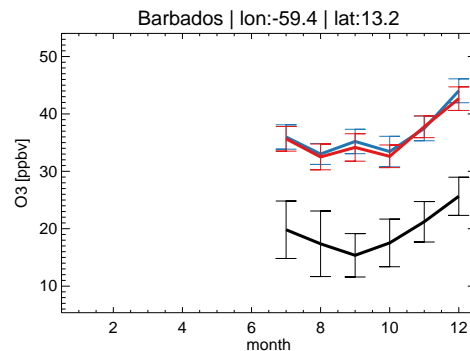
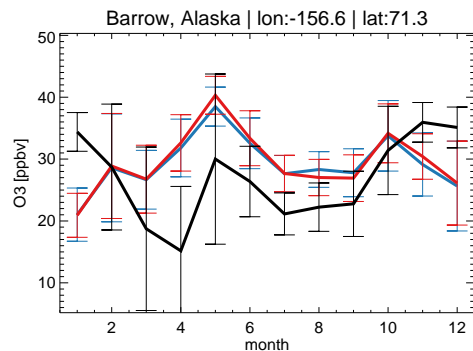
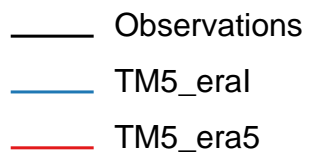
Zonal monthly mean OH concentrations for JULY 2006, from climatological average of Spivakovsky (top), and as simulated by the TM5 models.
Note: Spivakovsky is 8% too high on average.

Monthly averaged J(O1D) vs OH at Hohenpeissenberg

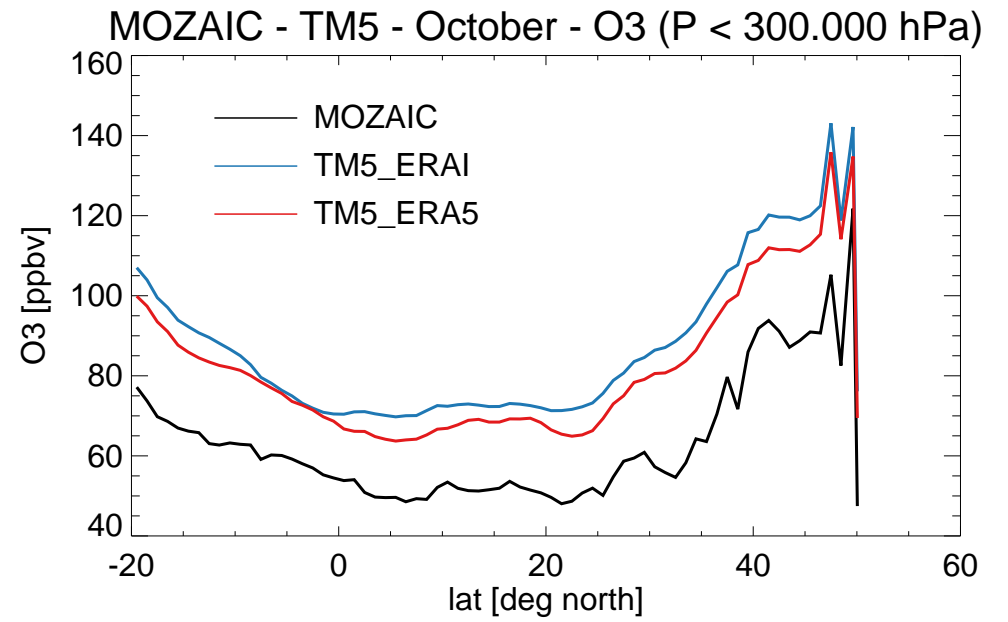
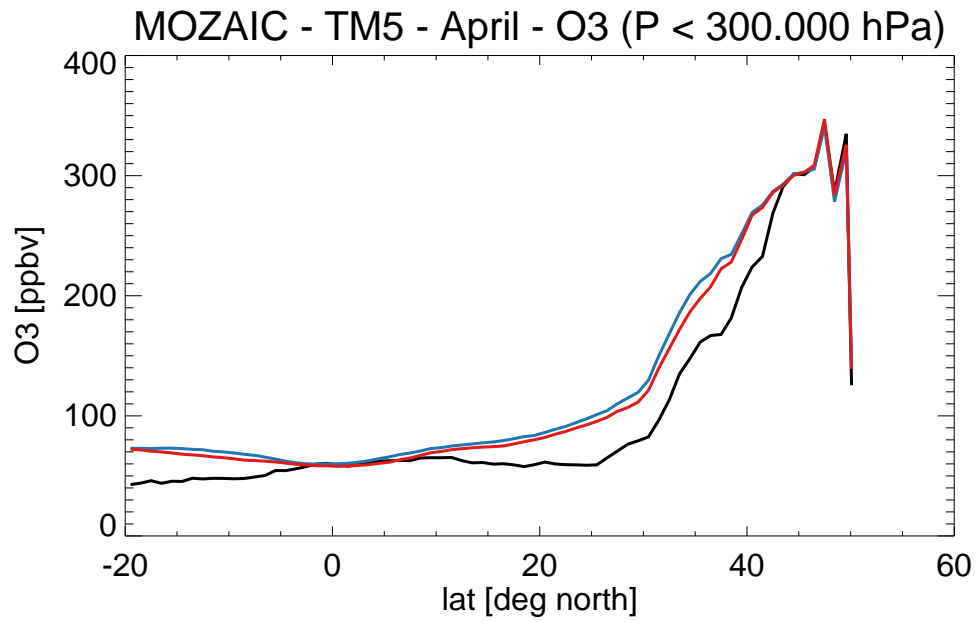


Monthly mean comparison of OH vs J(O1D) at Hohenpeissenberg. The dash line represents the approximate fit to measurement (Rohrer and Berresheim, doi:10.1038/nature04924, 2006). Correlation coefficients between OH and J(O1D) for JO1D values $< 7 \cdot 10^{-6}$ are shown.

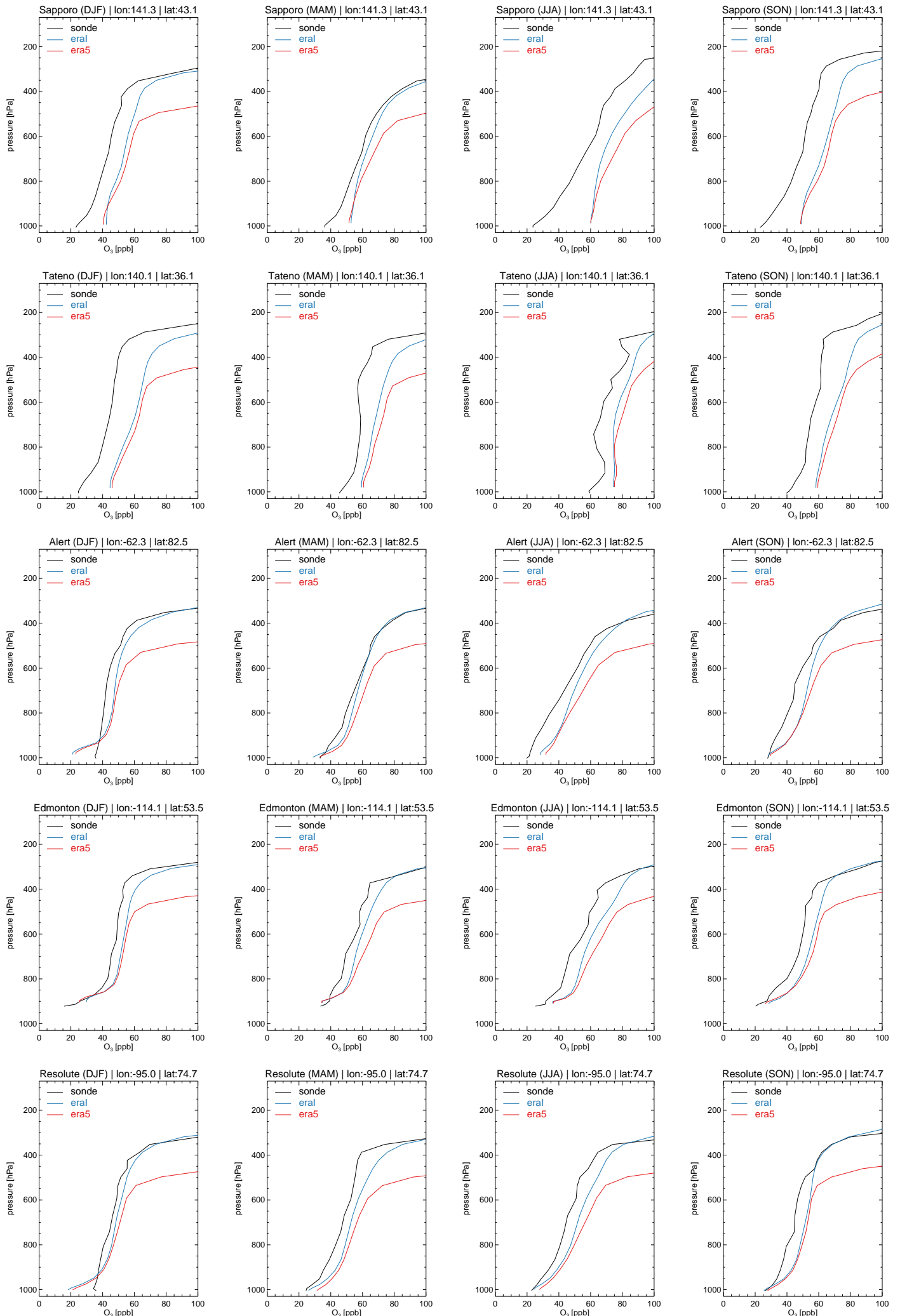
O3 comparisons (MOZAIC, CMDL, Sondes)

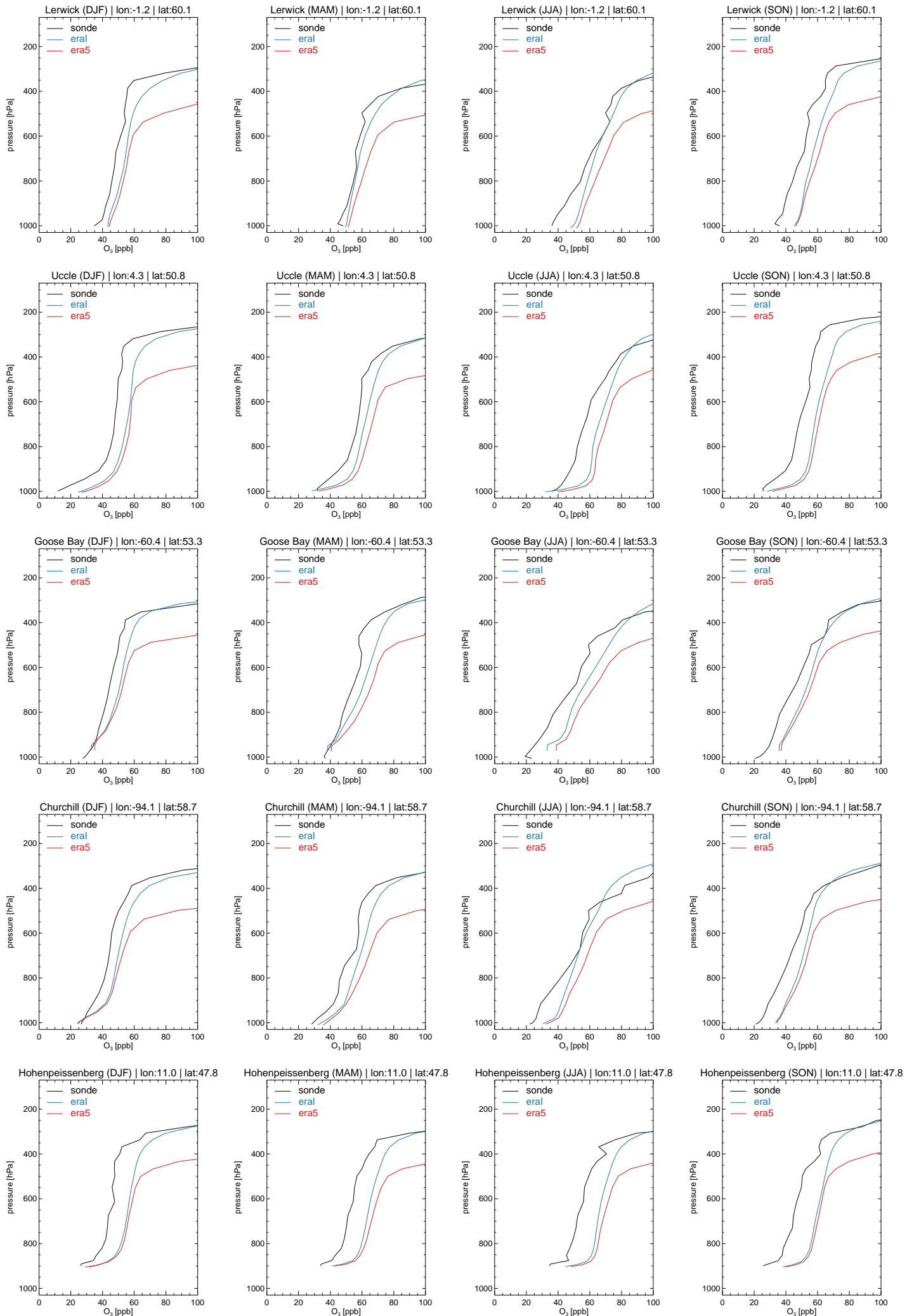


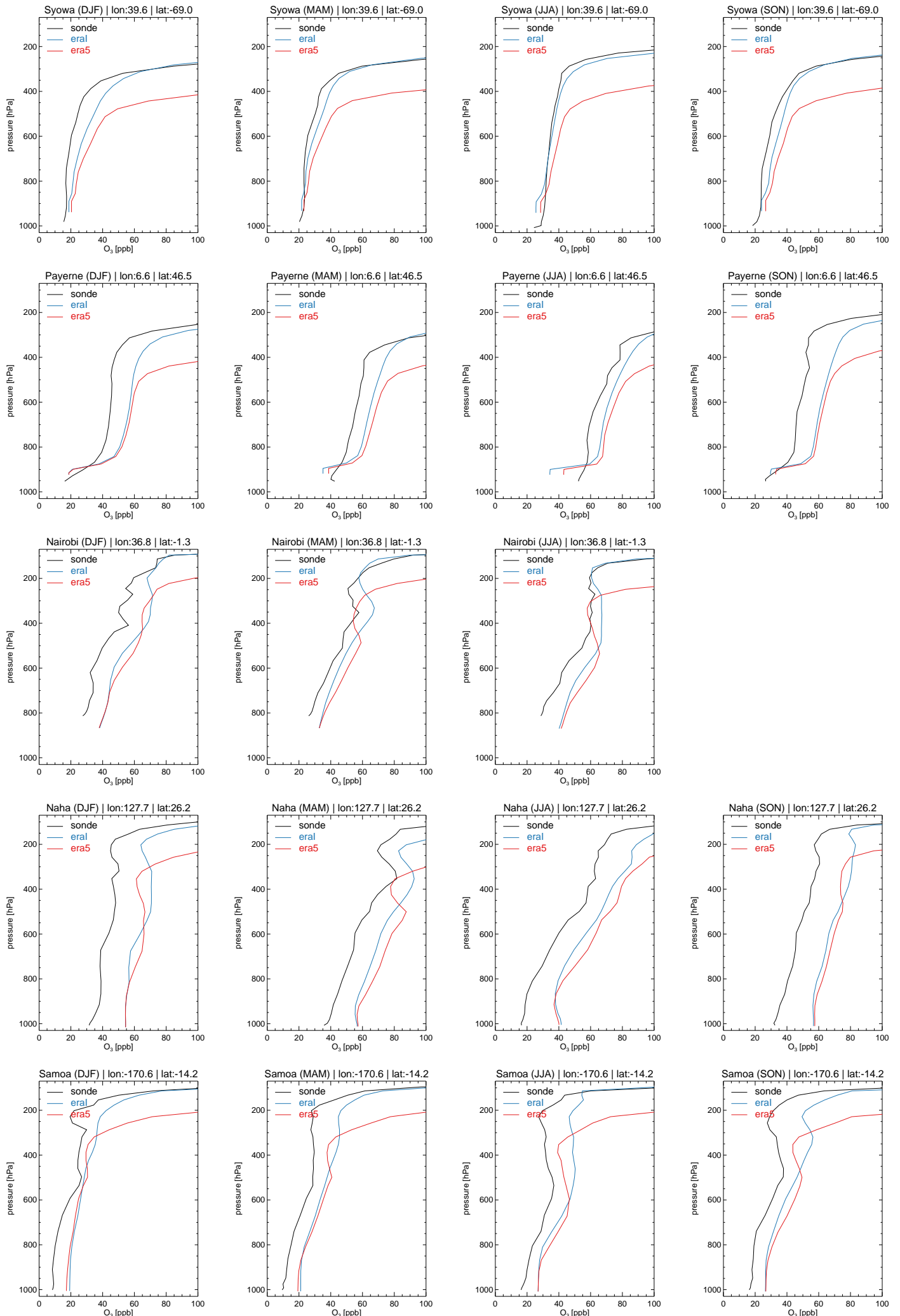
Monthly mean comparison of TM5 surface O3 against GMD(CMDL) surface observations using co-located model output for 2006, sampled at the measurement times. Error bars indicate the standard deviation in the monthly means.

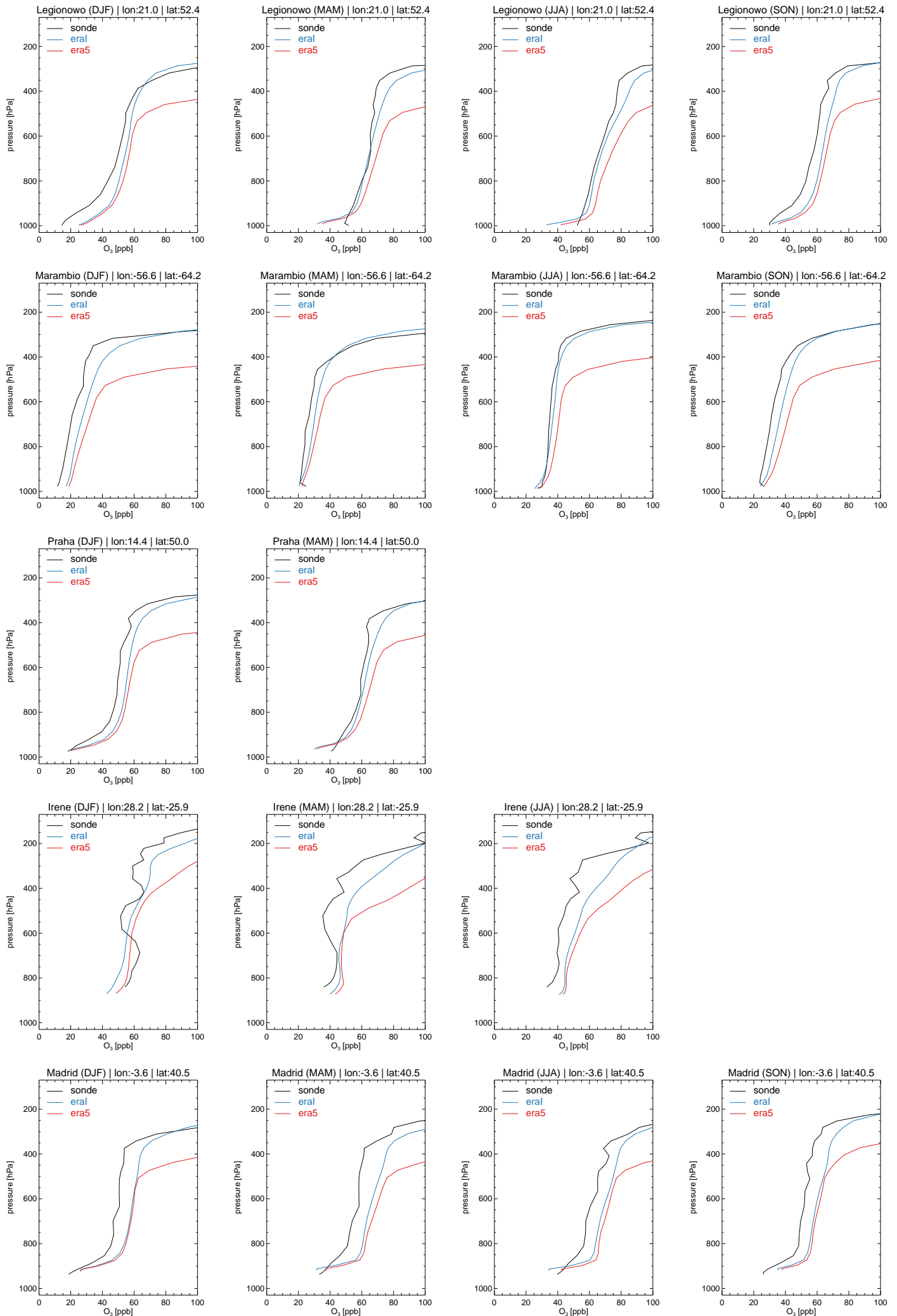


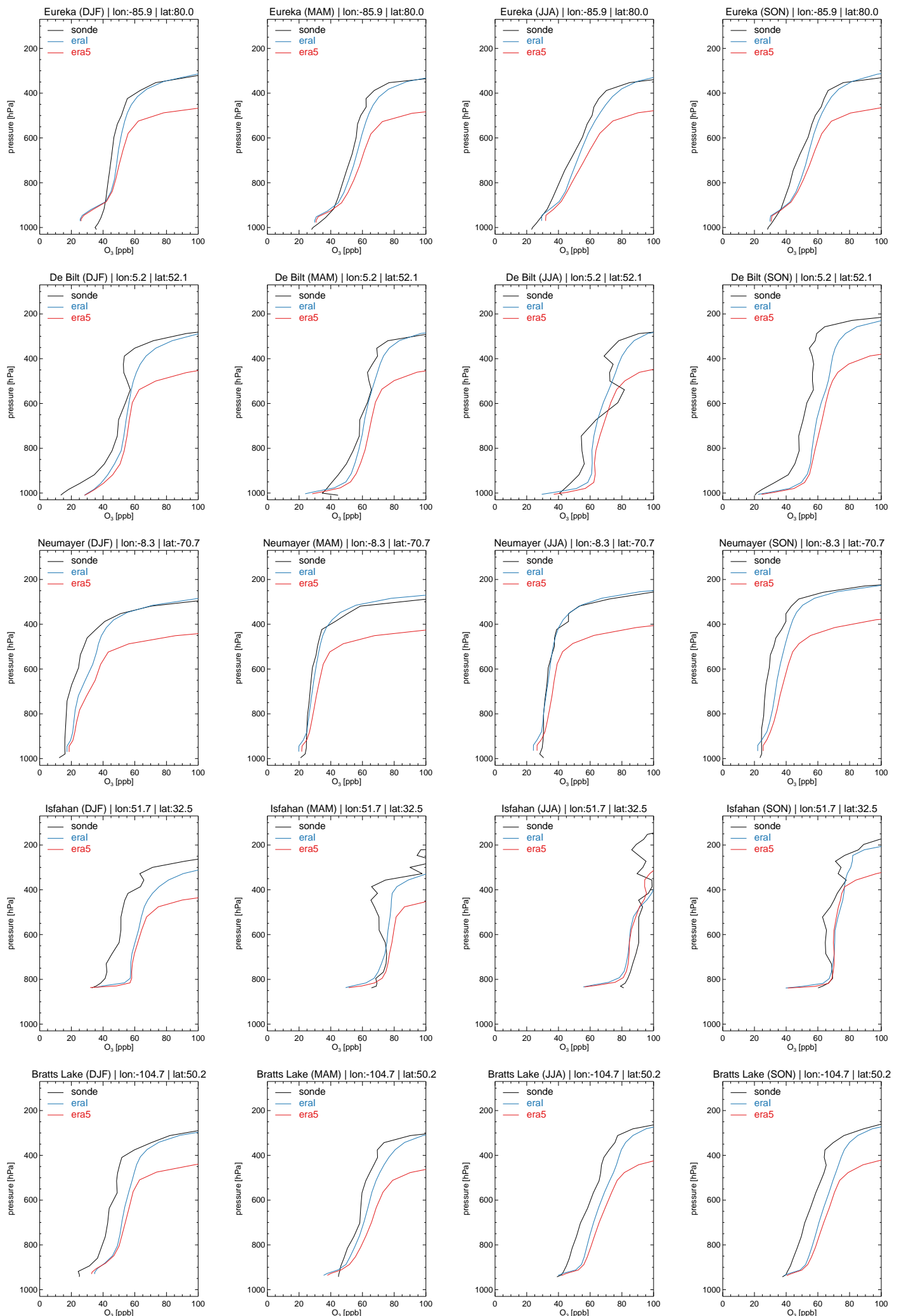
Monthly mean comparisons of TM5 UTLS O3 concentrations sampled at the measurement place and time against MOZAIC flight data between Frankfurt (N50.0, E8.6) and Windhoek (E17.7, S22.5) for April (left column) and October 2006 (right). Data at pressures higher than 300 hPa has been filtered out.

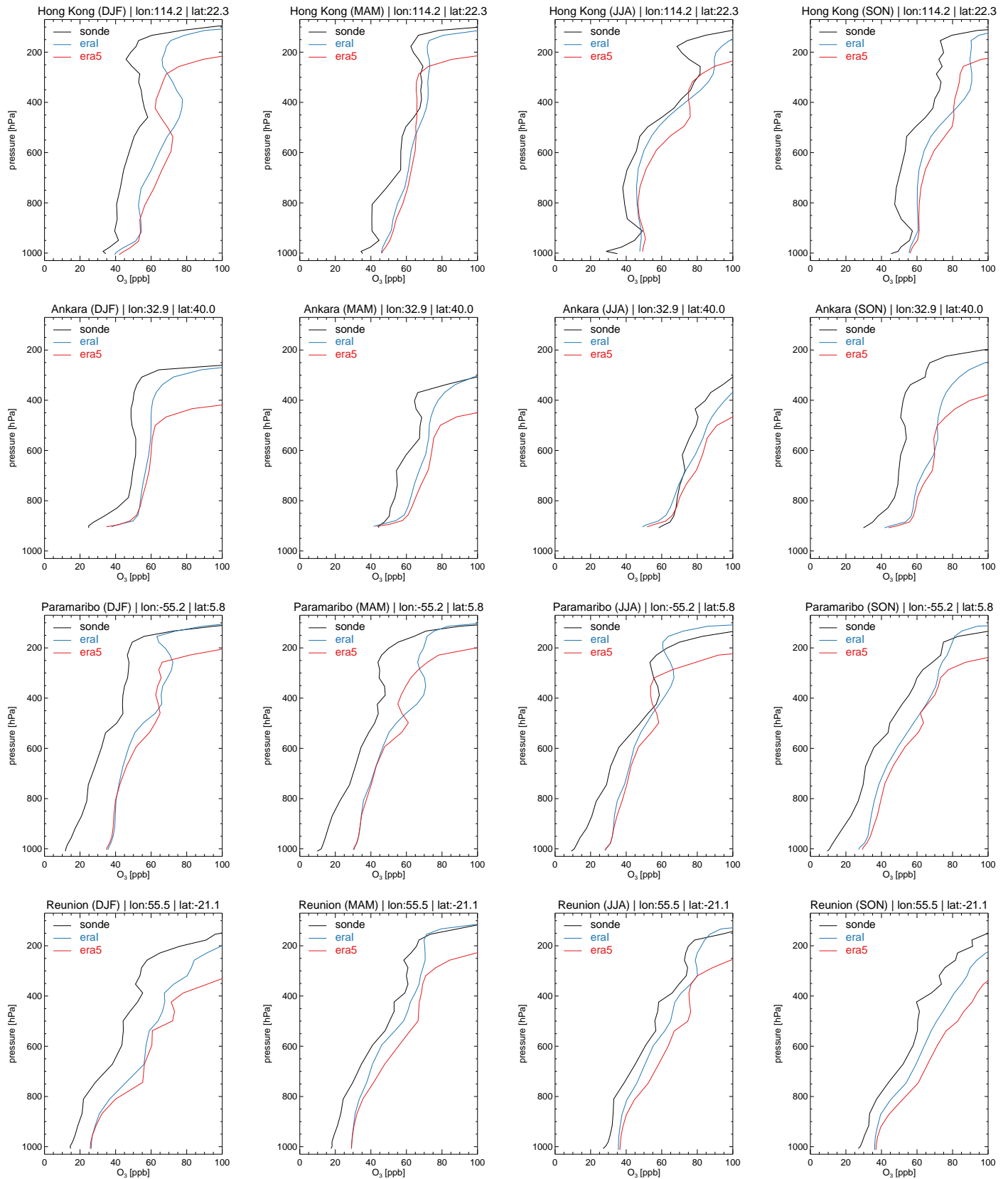




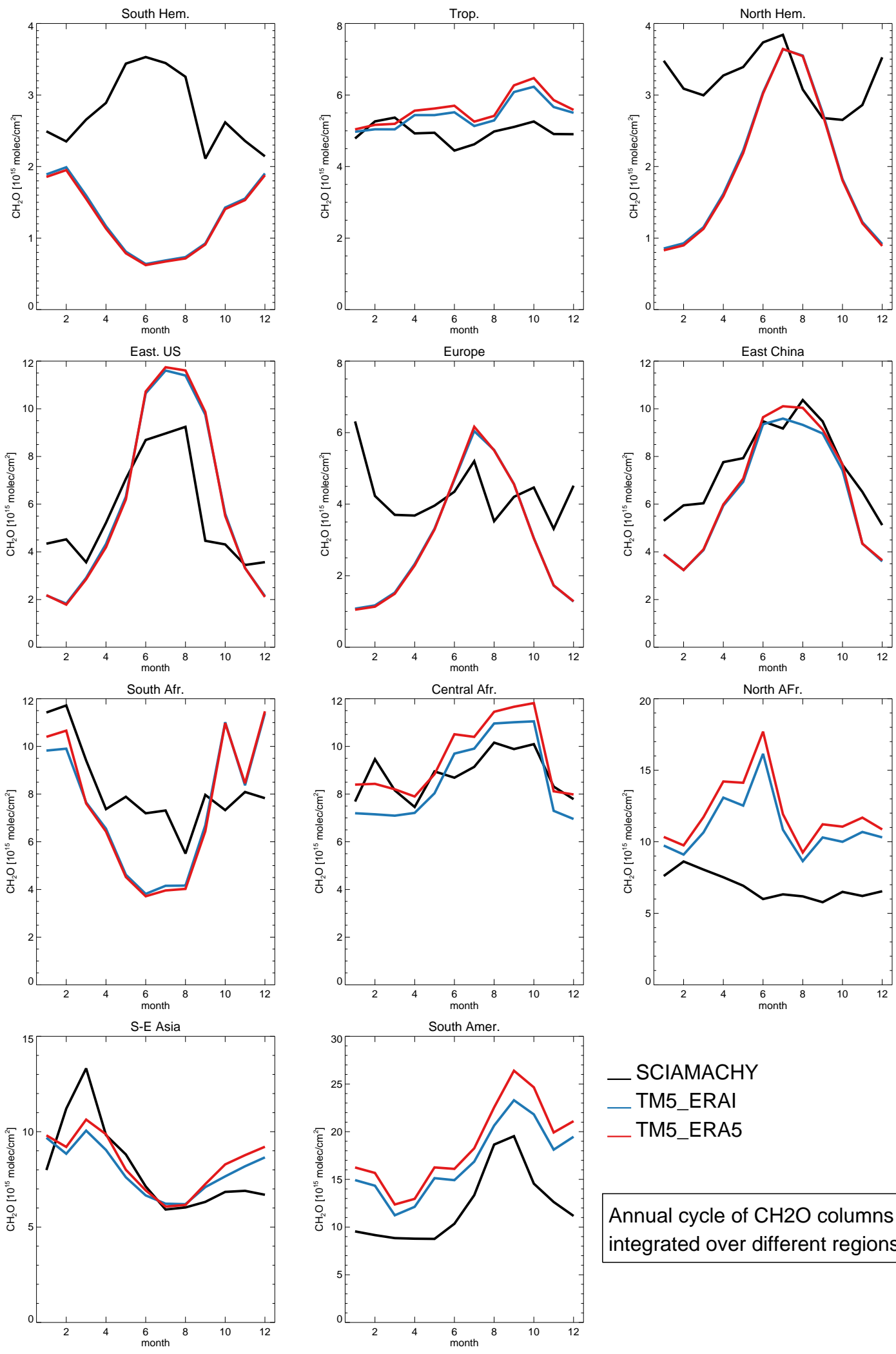








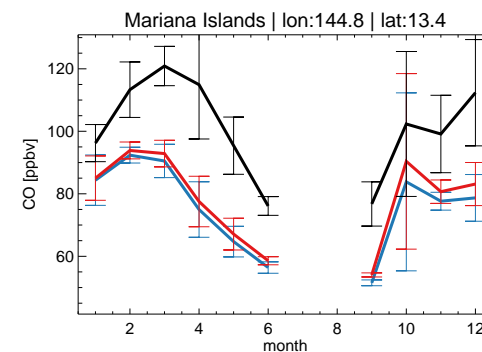
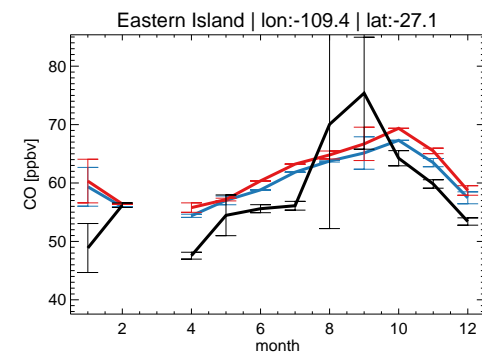
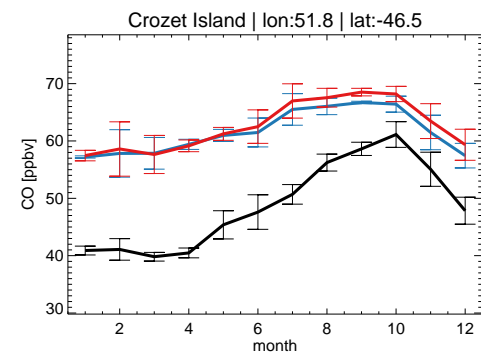
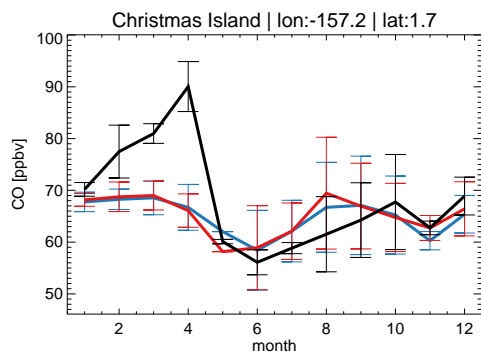
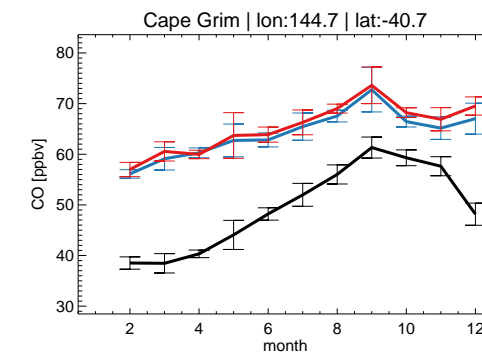
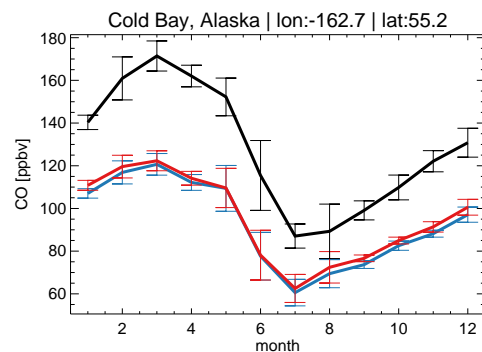
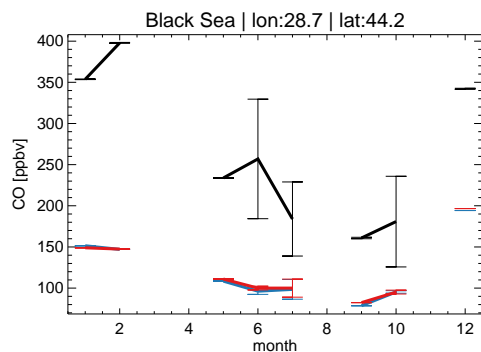
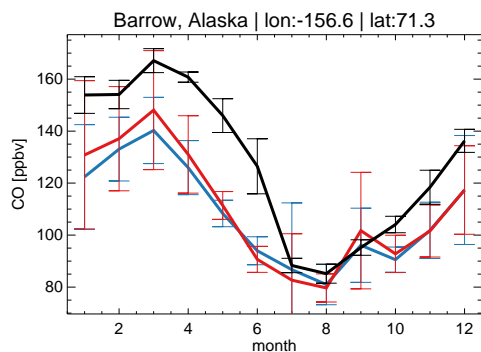
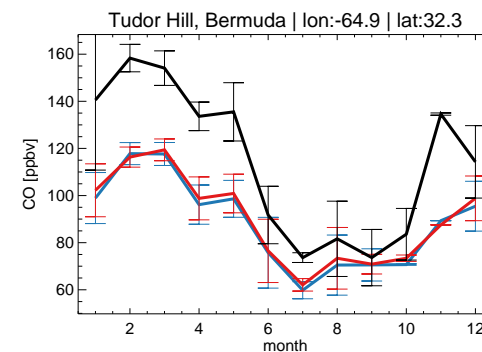
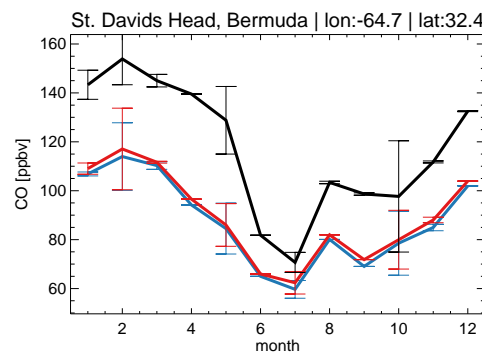
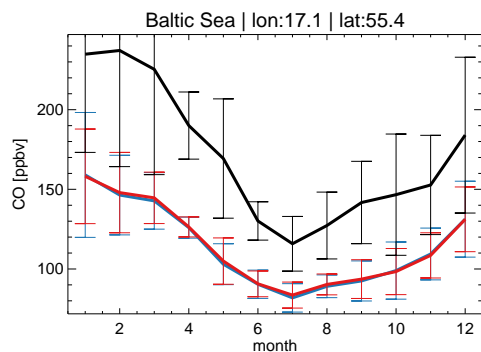
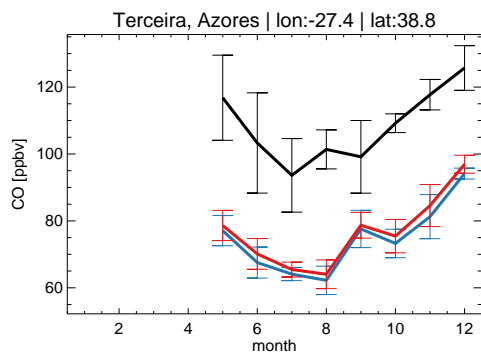
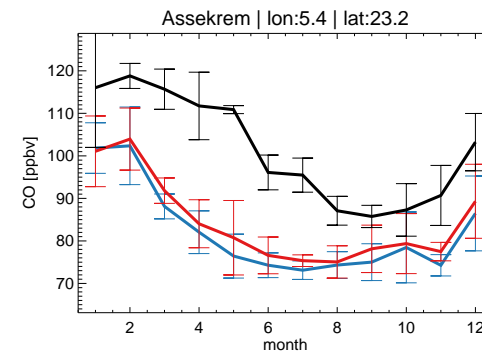
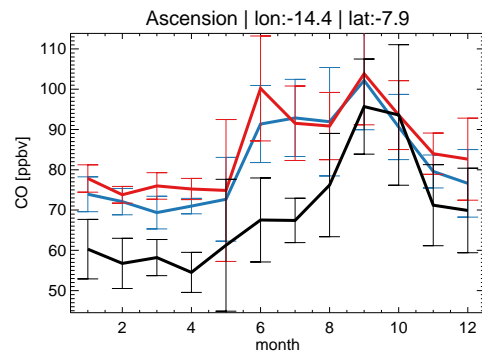
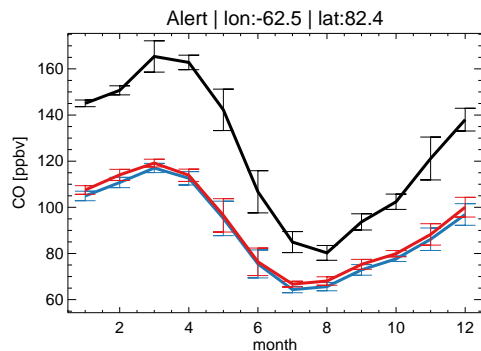
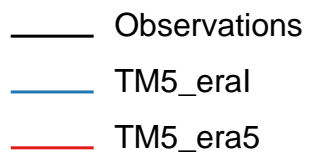
CH₂O comparisons (SCIAMACHY)

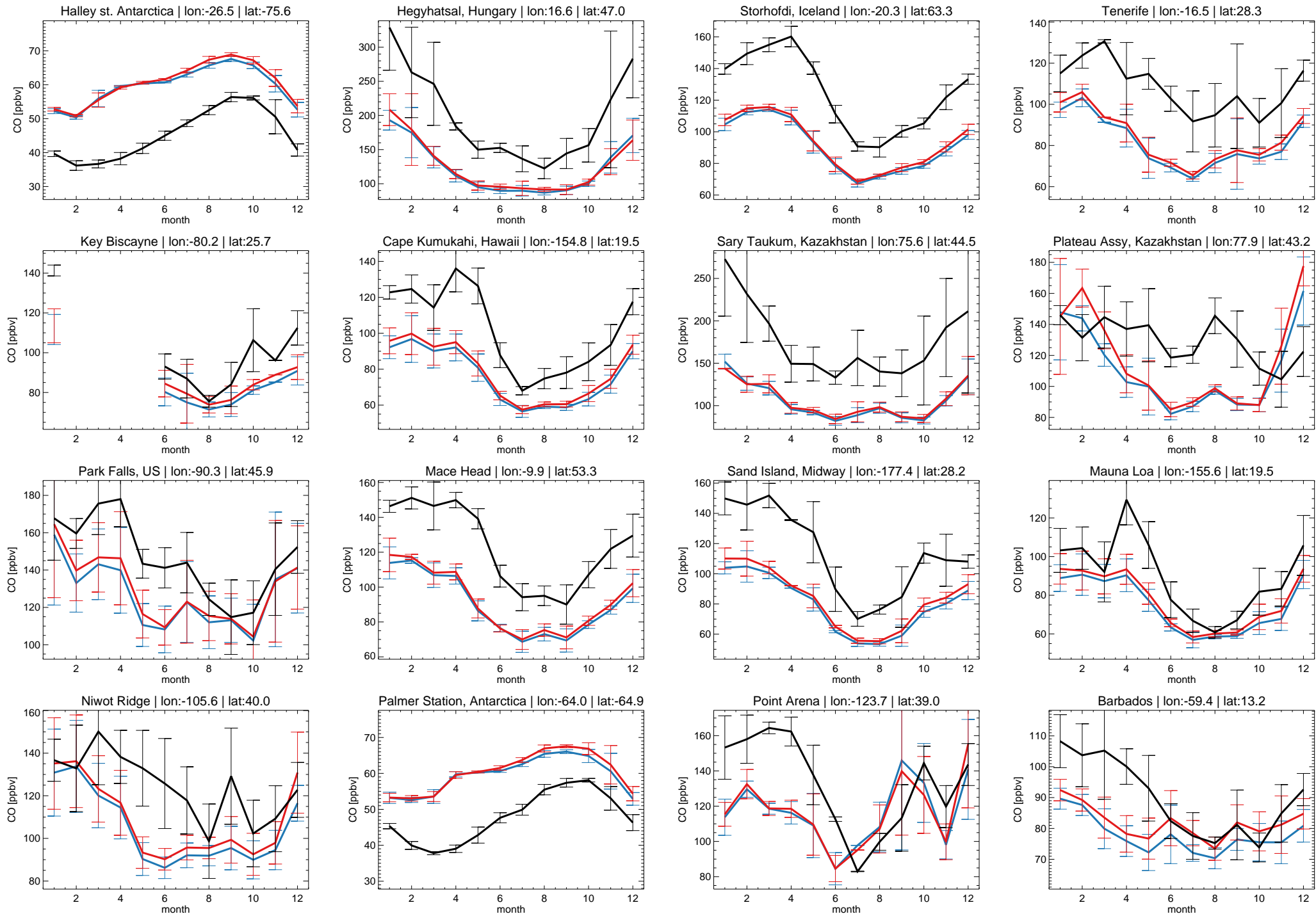


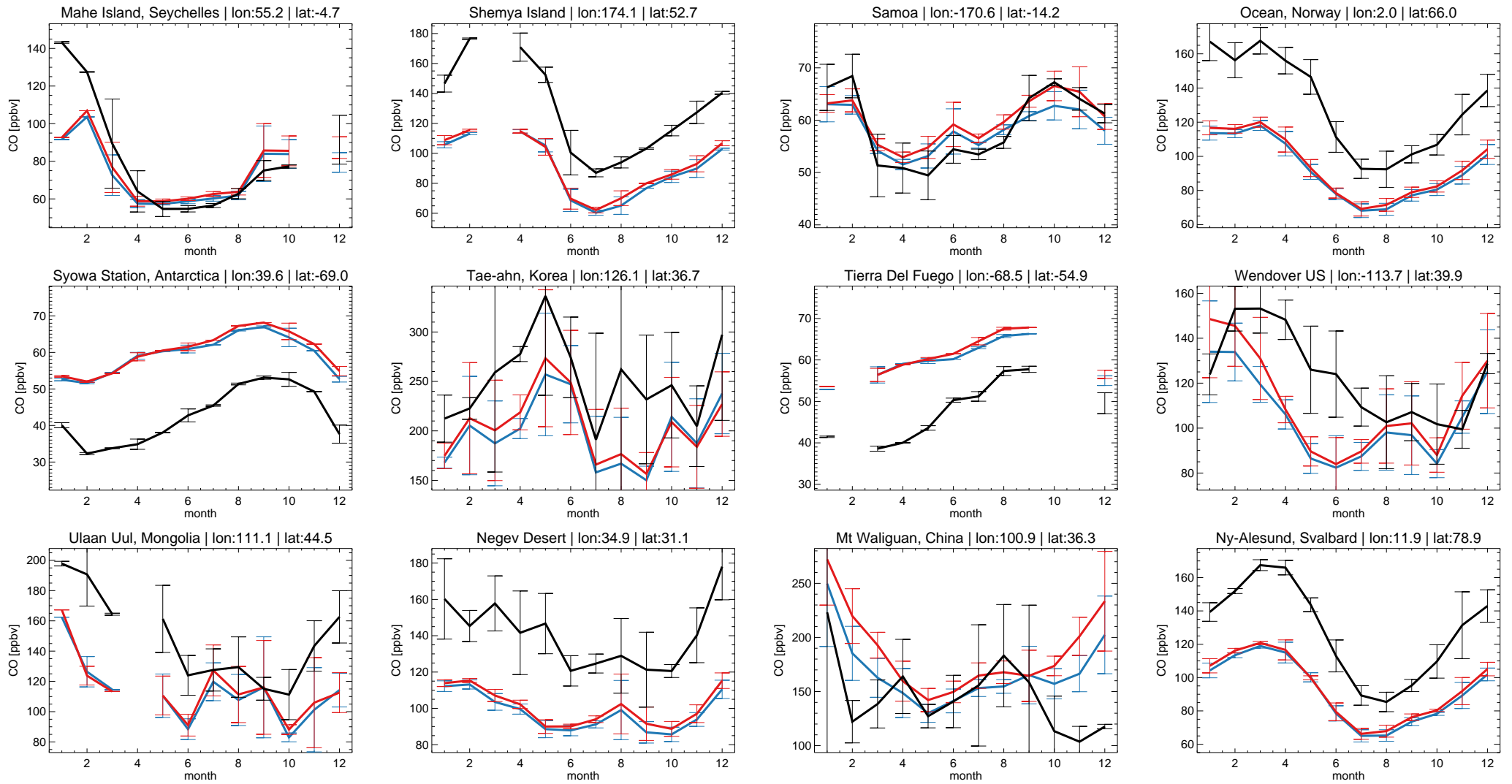
— SCIAMACHY
 — TM5 ERAI
 — TM5 ERA5

Annual cycle of CH₂O columns integrated over different regions.

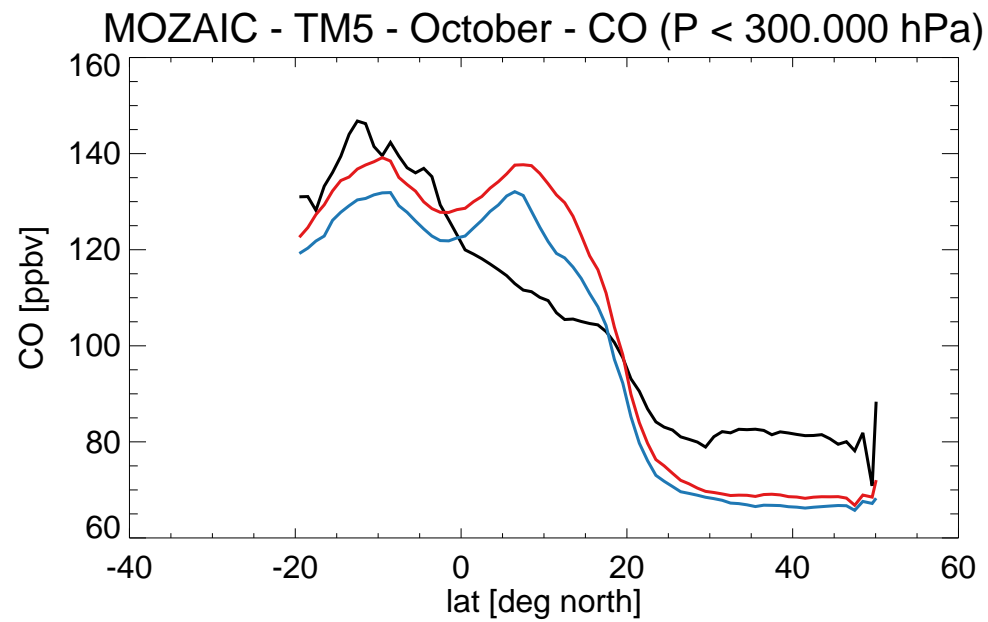
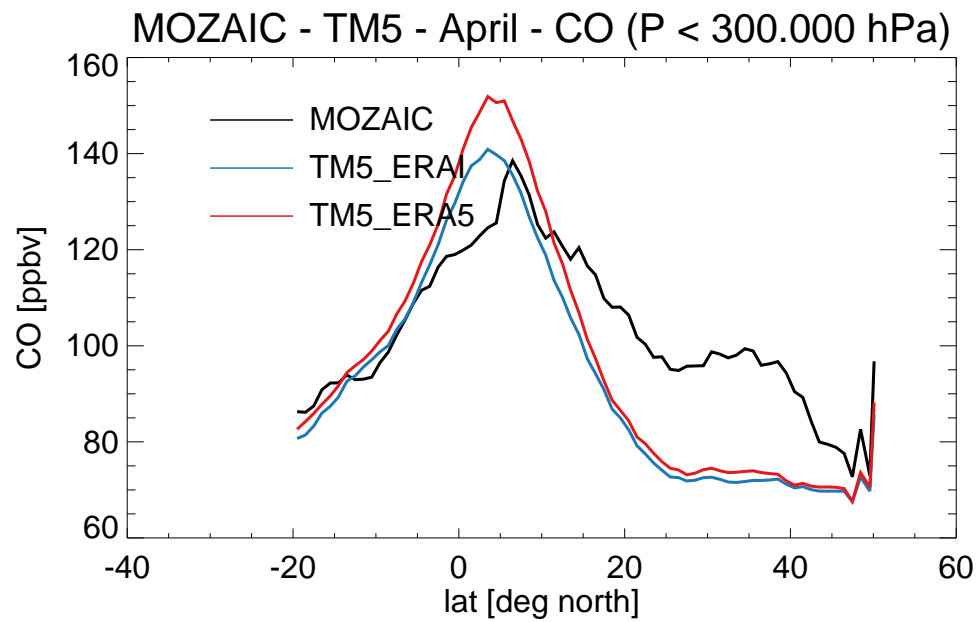
CO comparisons (MOPITT, CMDL, MOZAIC)





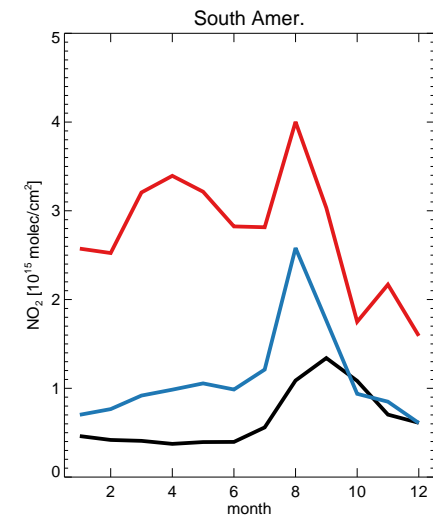
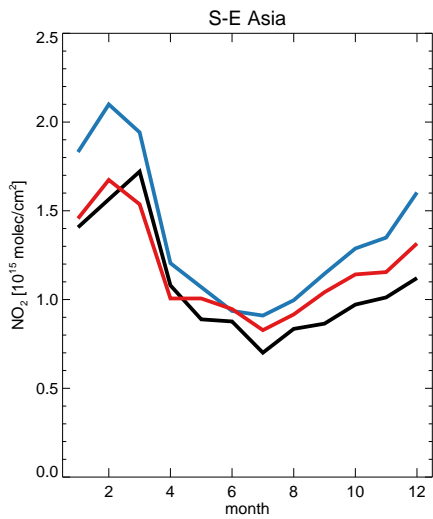
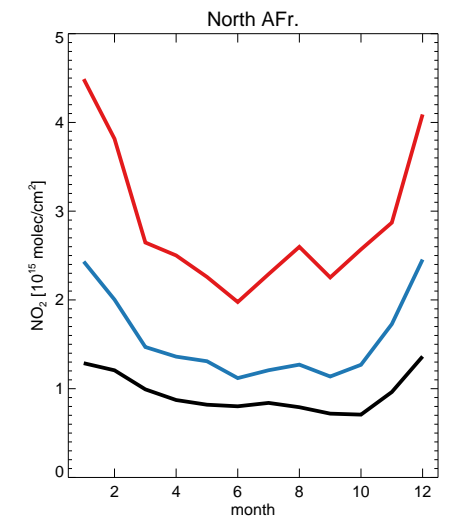
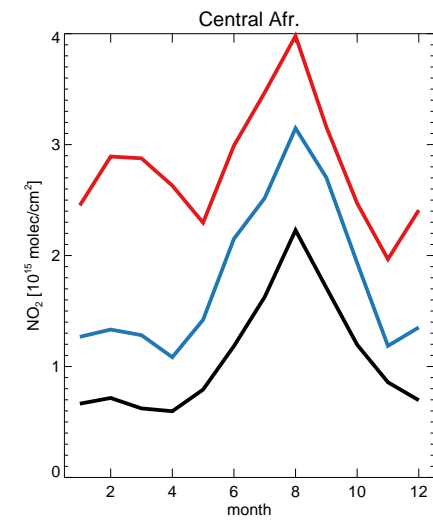
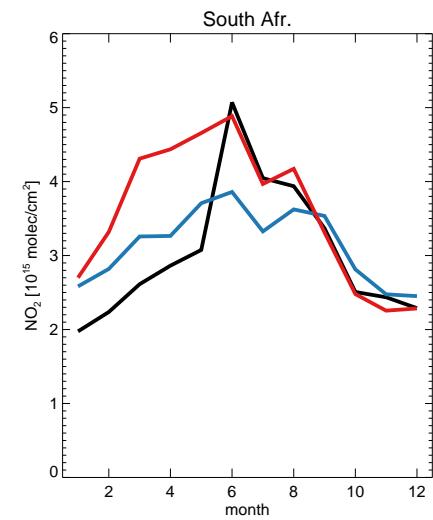
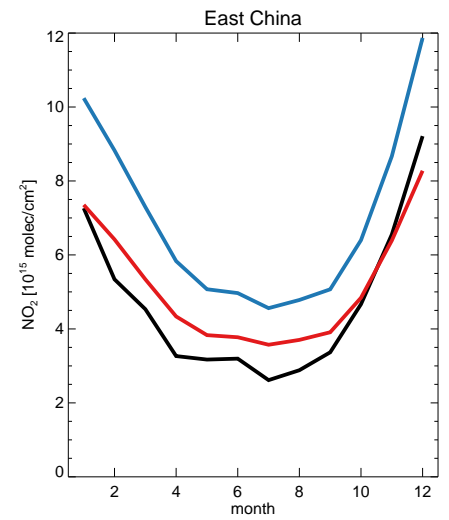
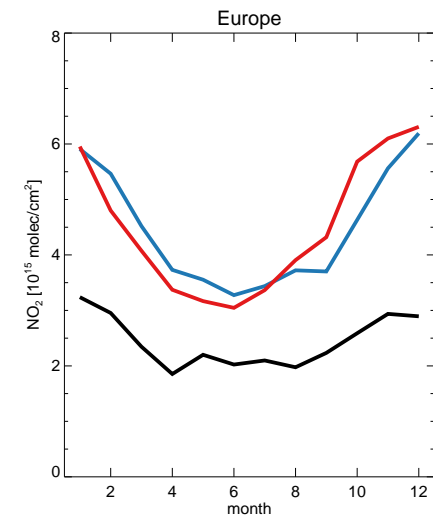
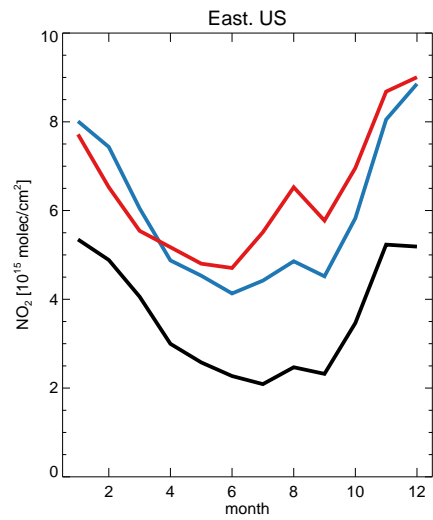
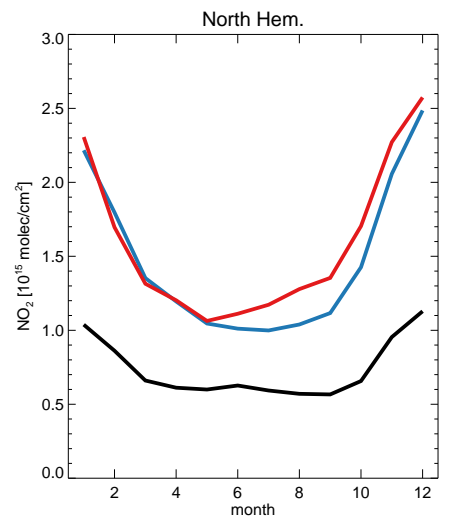
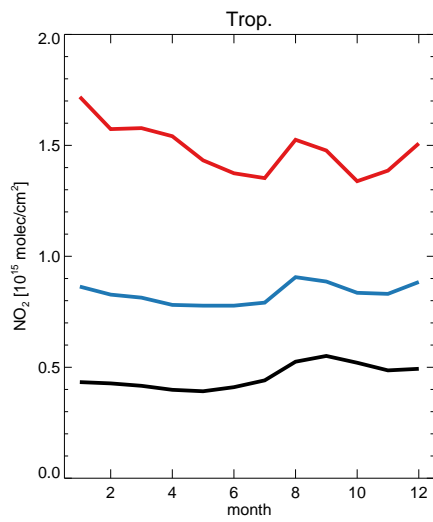
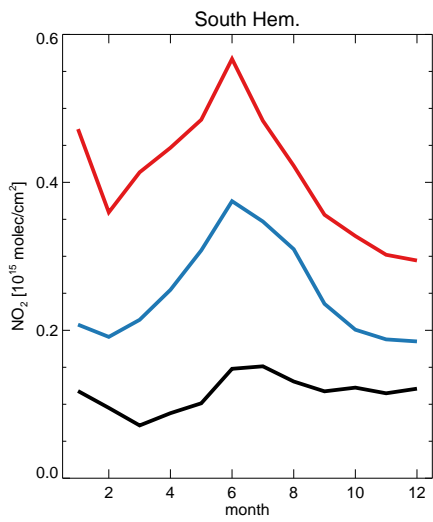


Monthly mean comparison of TM5 surface CO against GMD(CMDL) surface observations using co-located model output for 2006, sampled at the measurement times. Error bars indicate the standard deviation in the monthly means.



Monthly mean comparisons of TM5 UTLS CO concentrations sampled at the measurement place and time against MOZAIC flight data between Frankfurt (N50.0, E8.6) and Windhoek (E17.7, S22.5) for April (left column) and October 2006 (right). Data at pressures higher than 300 hPa has been filtered out.

NO₂ comparisons (OMI)



— OMI
 — TM5 ERAI
 — TM5 ERA5

Annual cycle of NO₂ columns integrated over different regions.