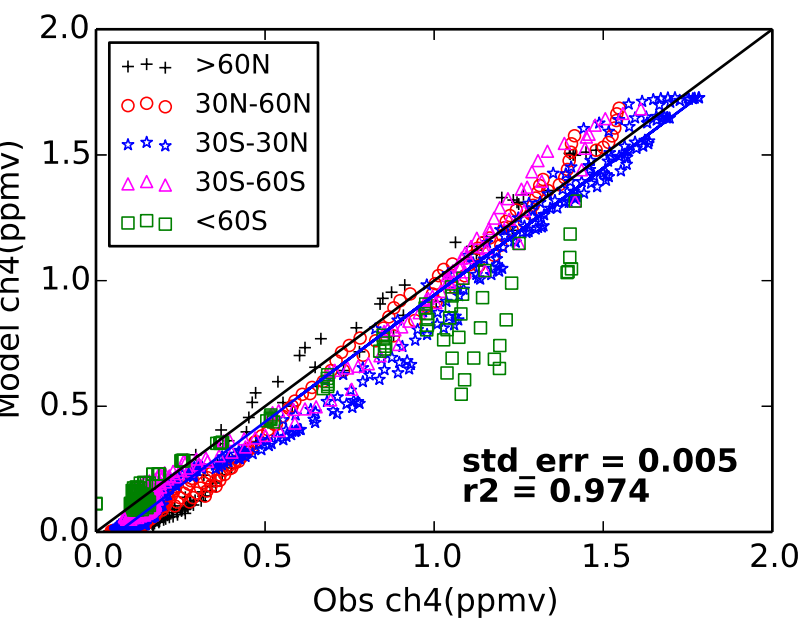
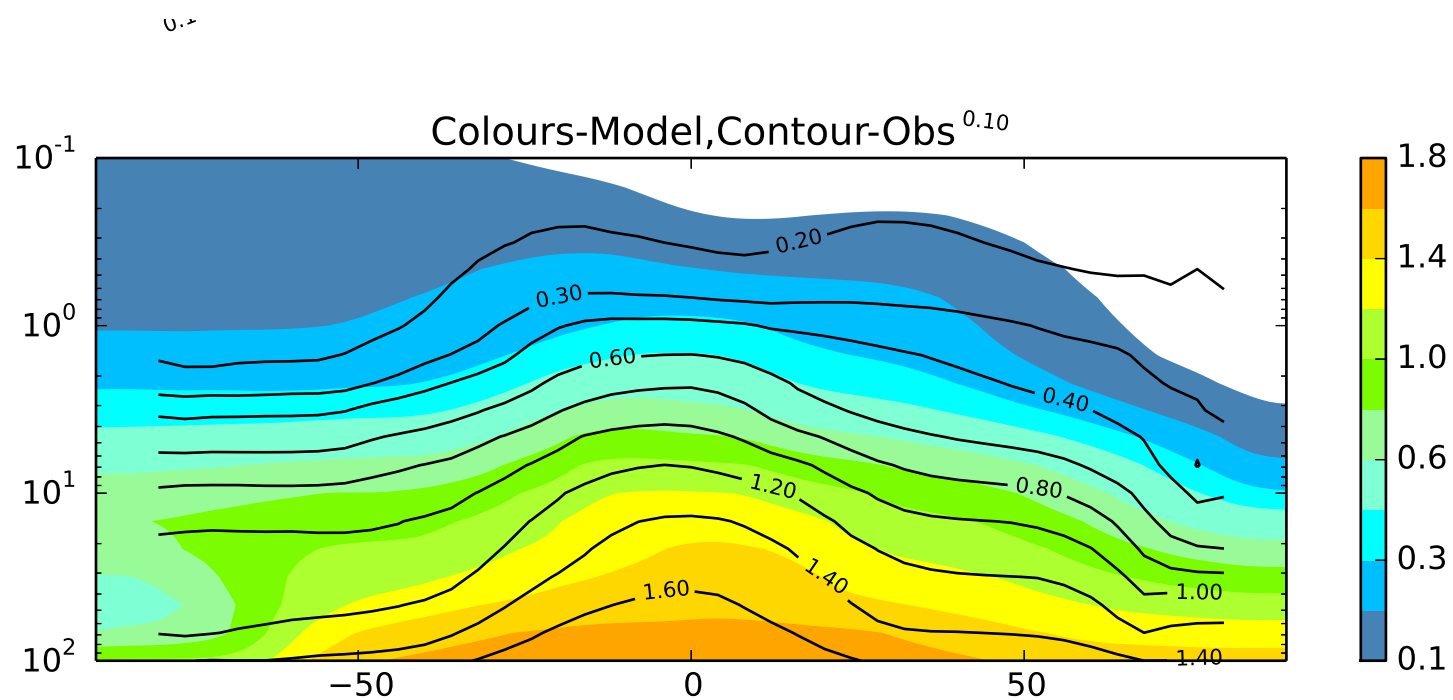
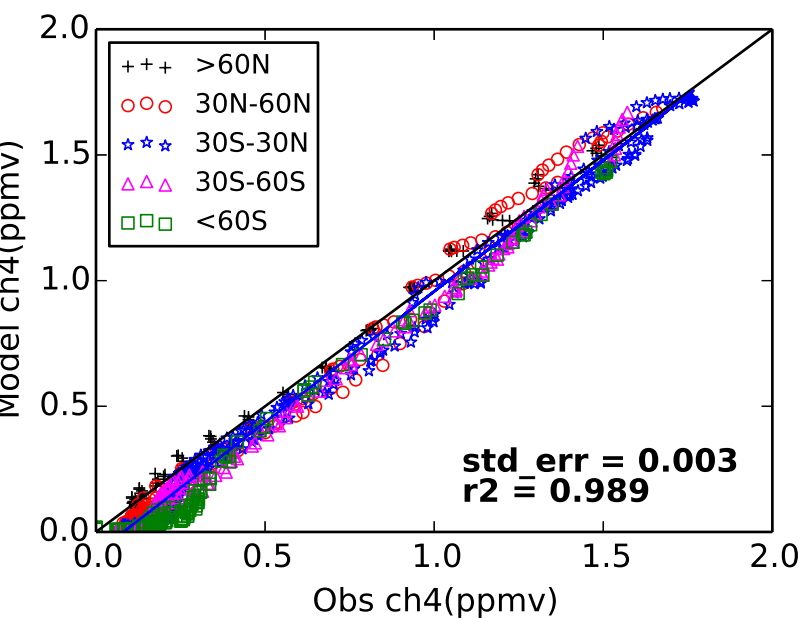
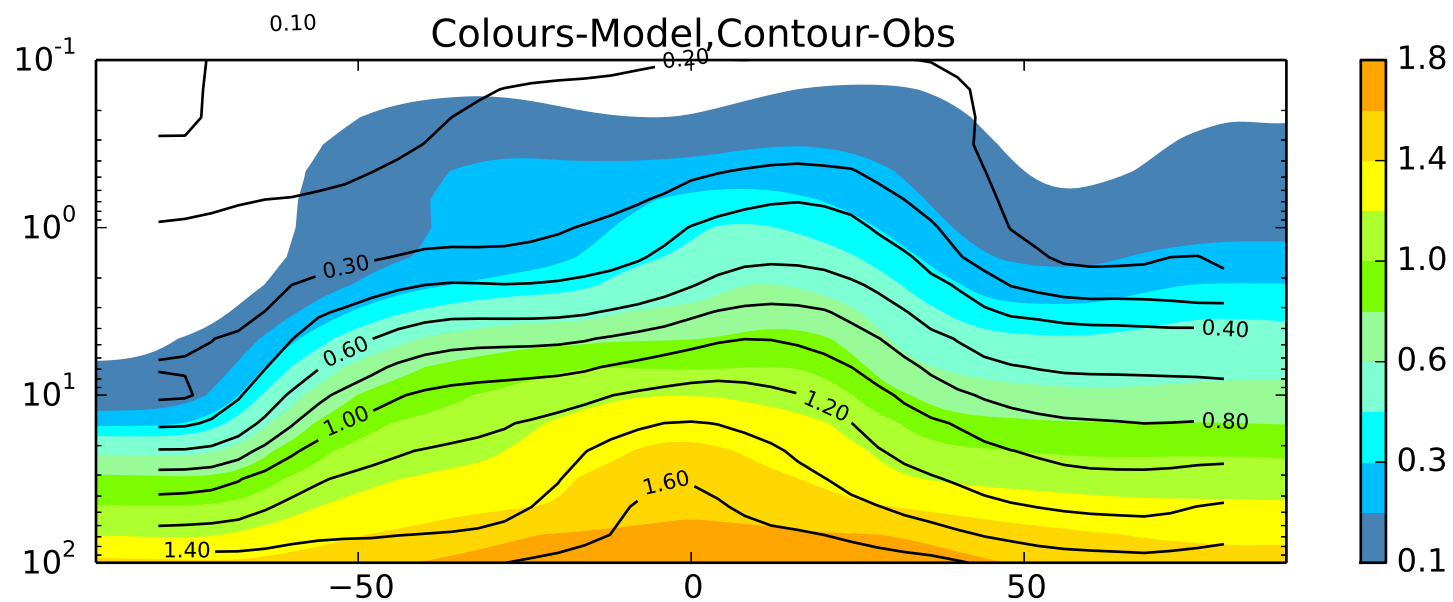
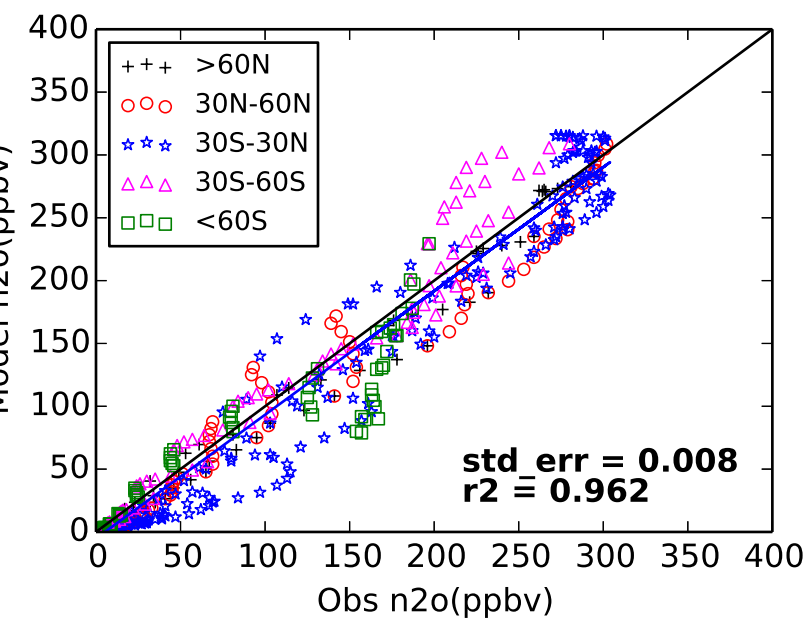
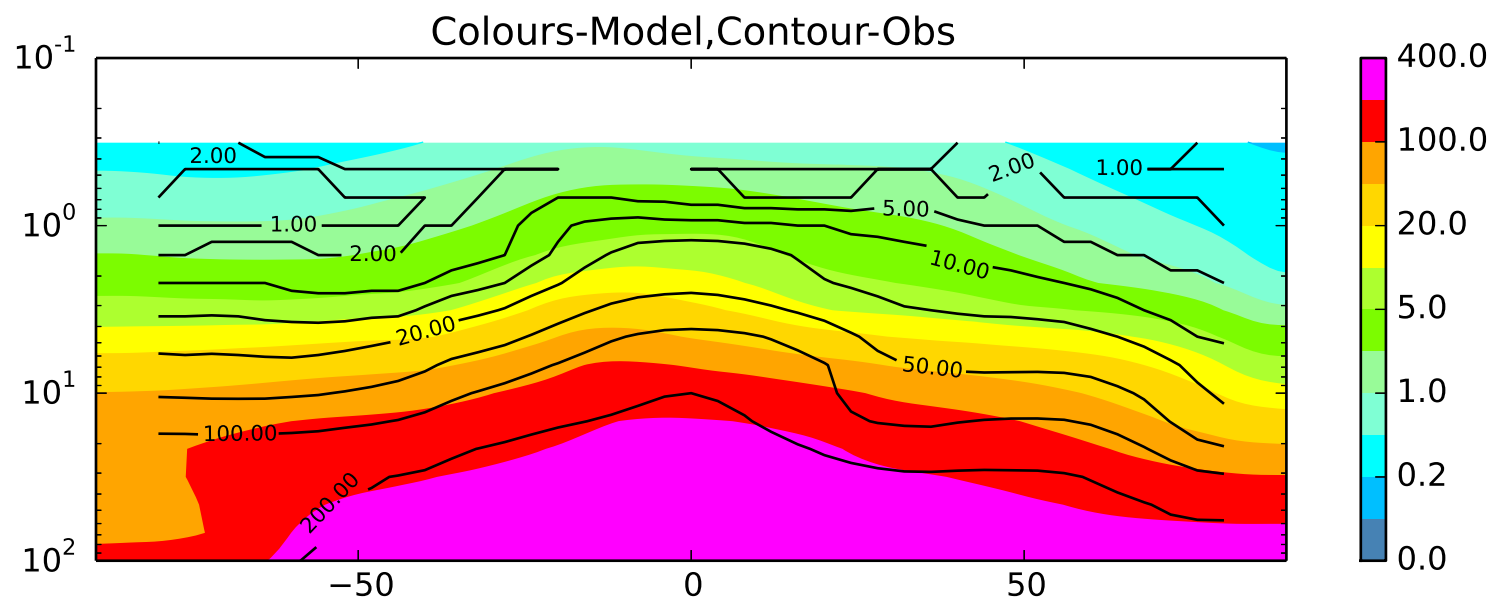




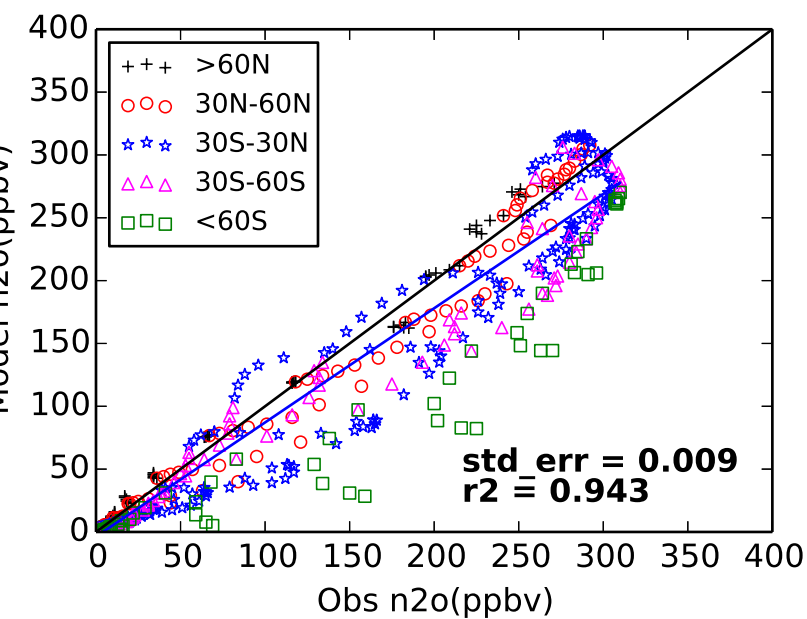
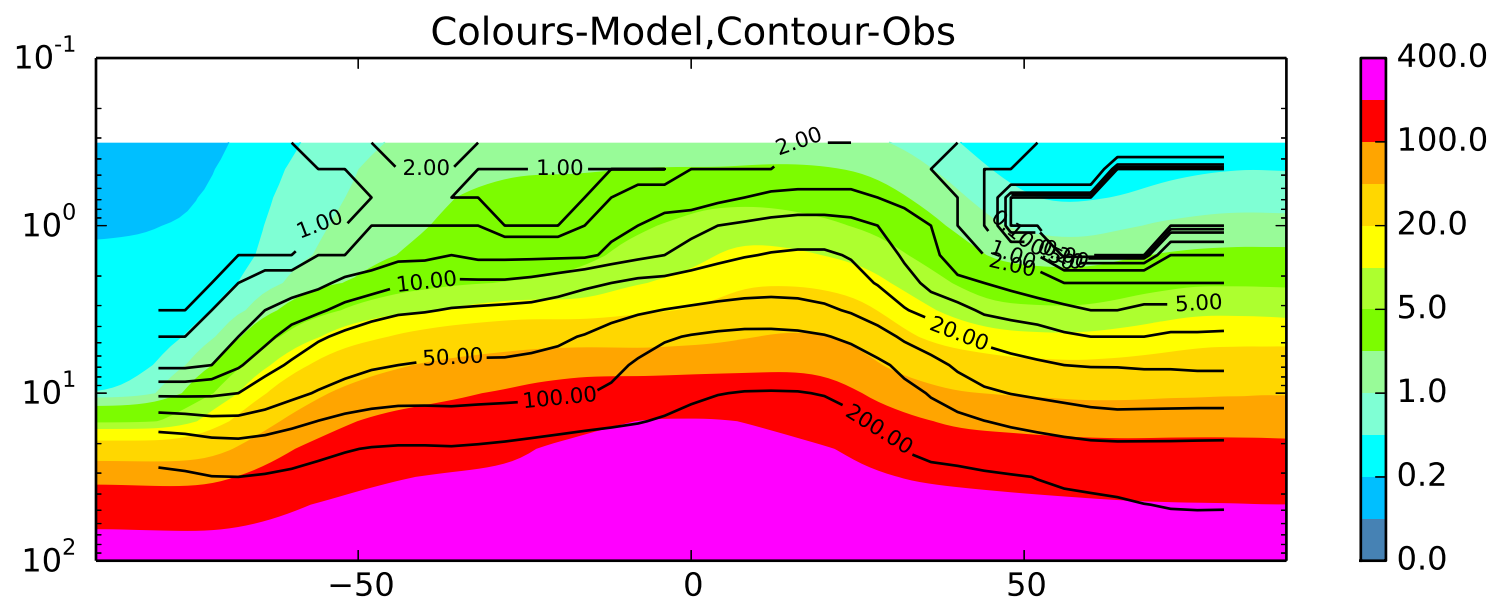
UKCA vs HALOE:
CH₄ (ppmv) Jan



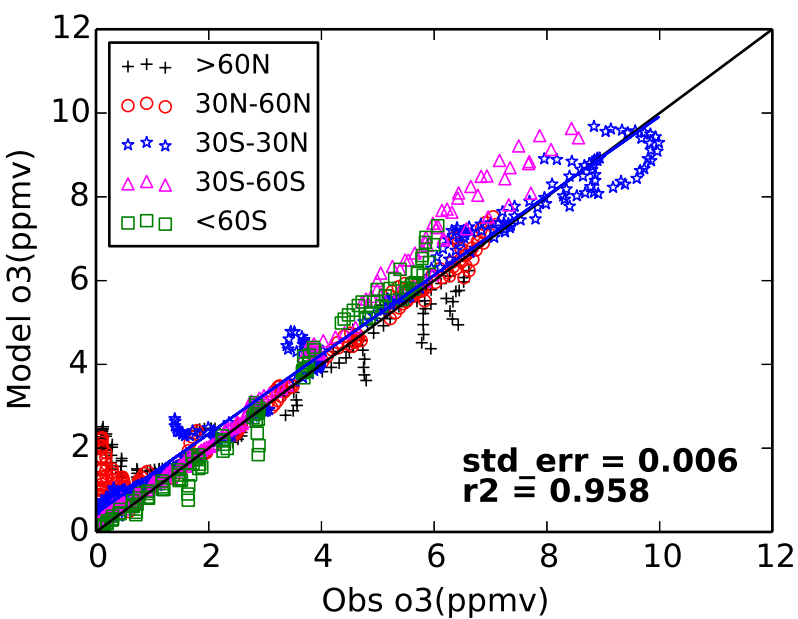
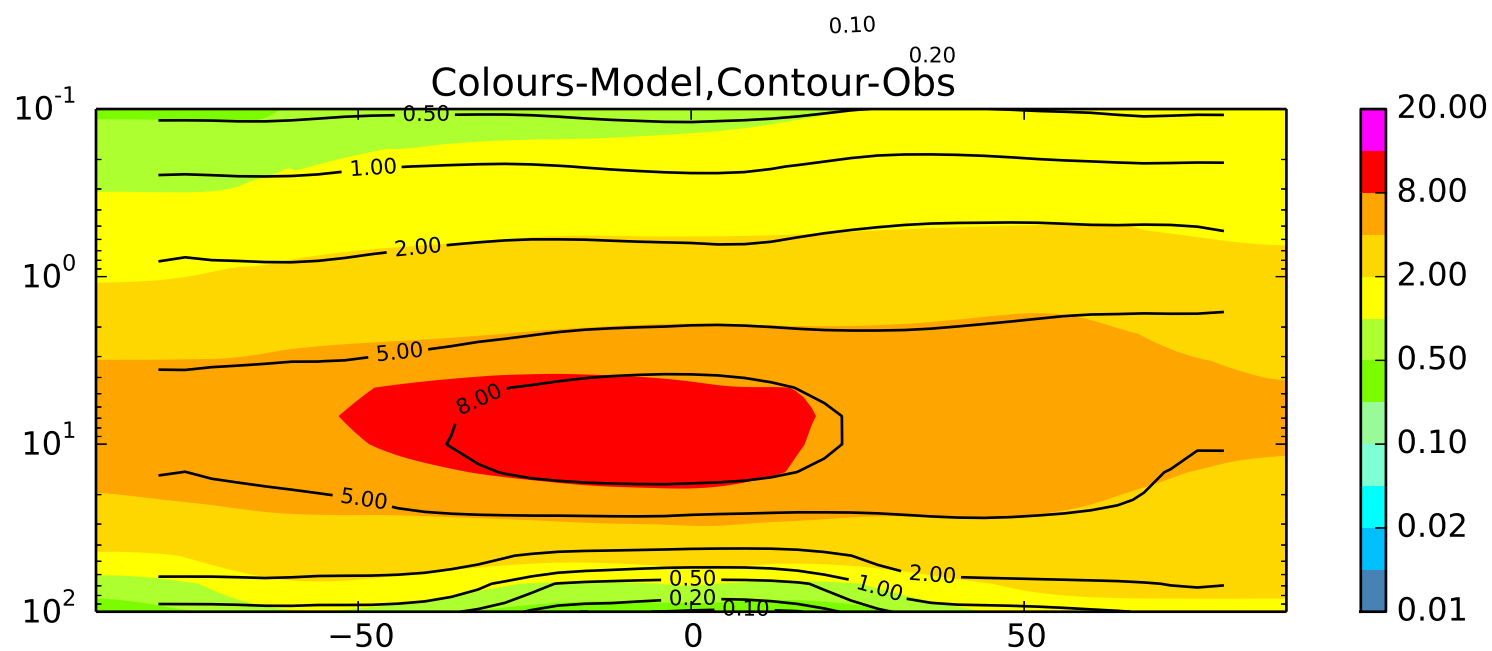
UKCA vs HALOE:
CH4 (ppmv) Jul



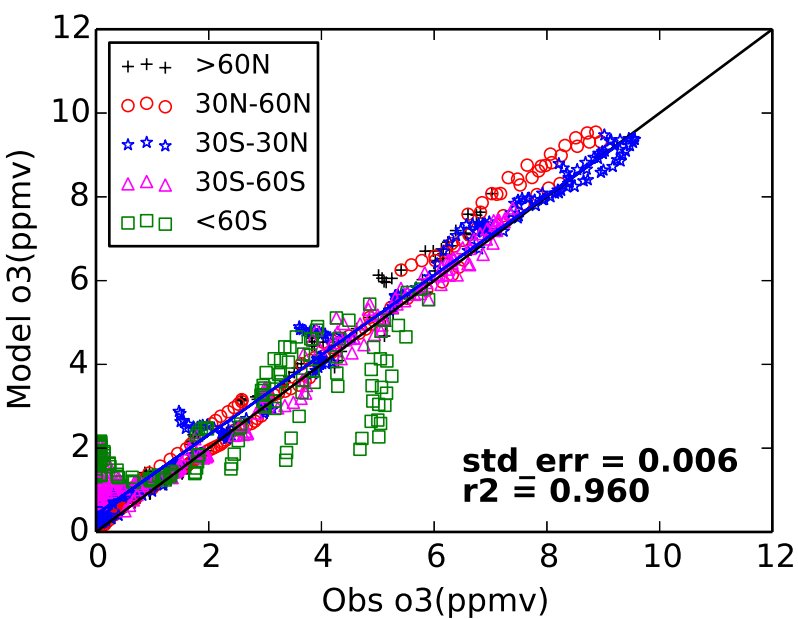
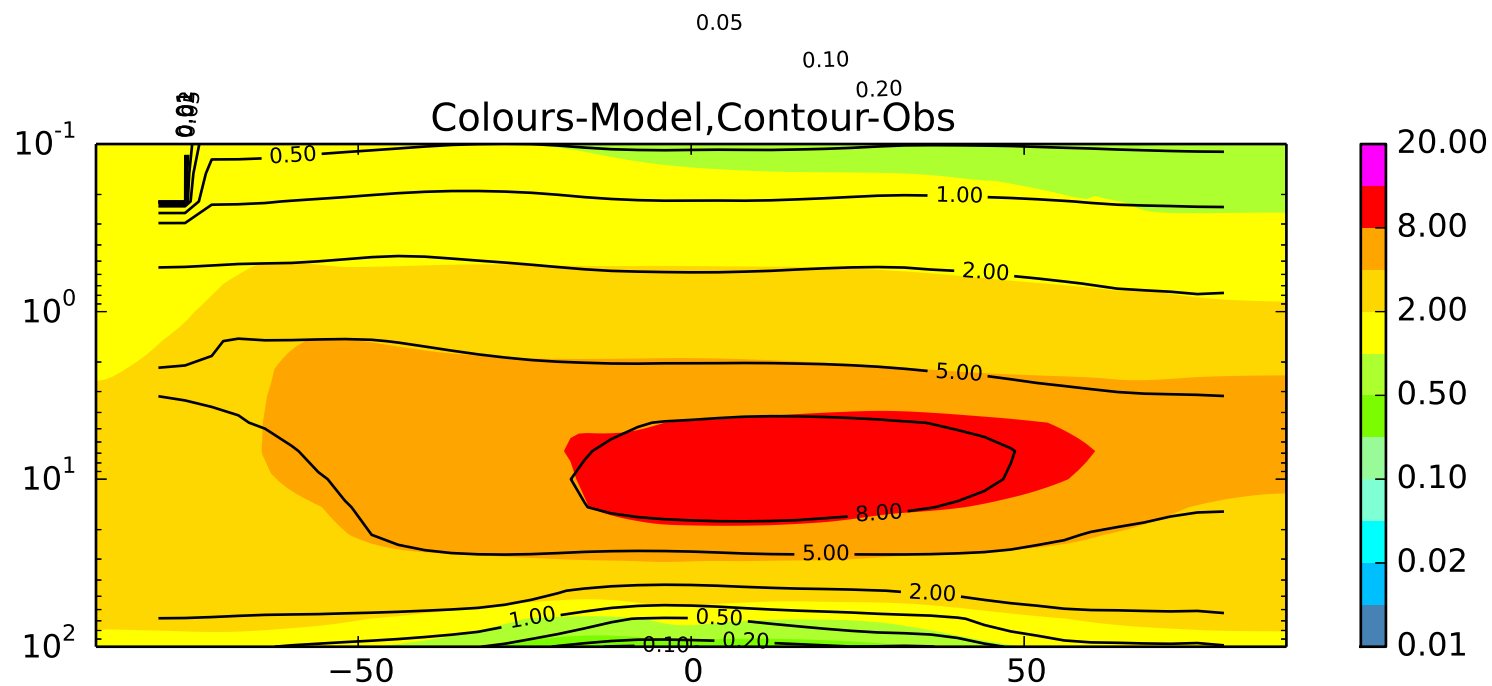
UKCA vs HALOE:
N2O (ppmv) Jan



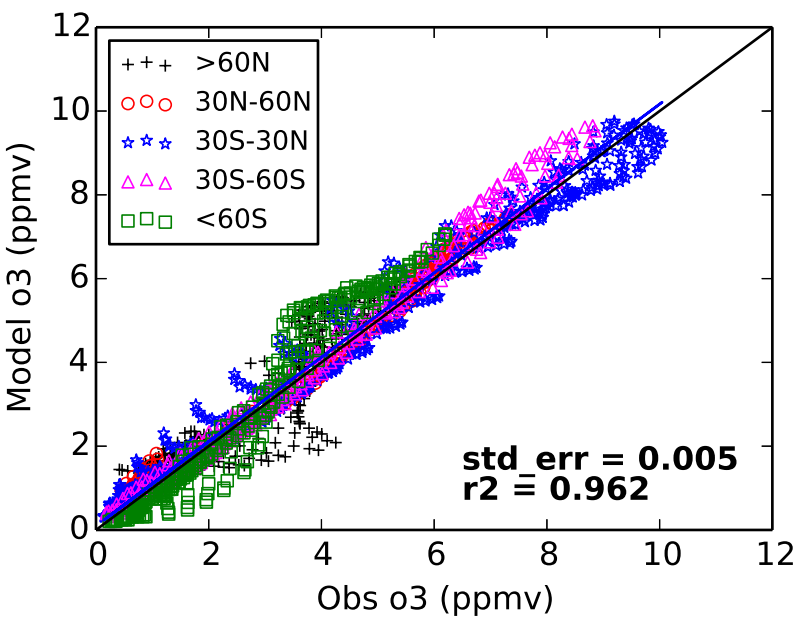
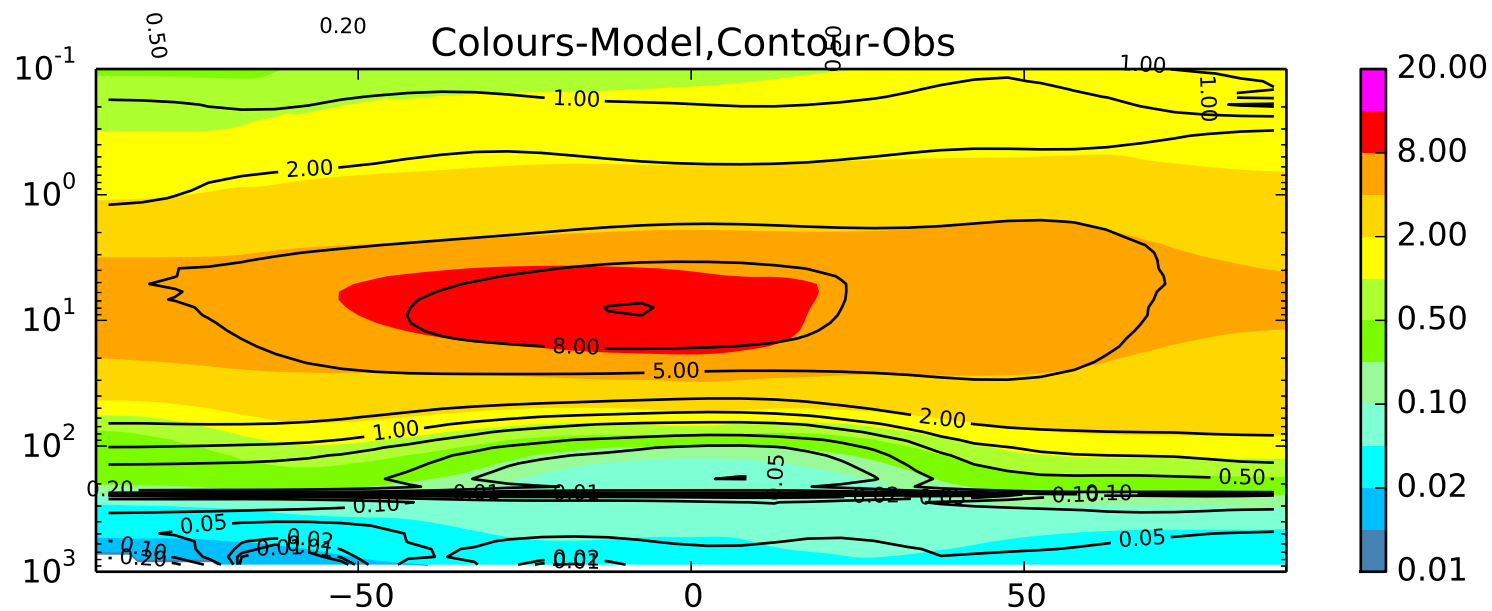
UKCA vs HALOE:
N₂O (ppmv) Jul



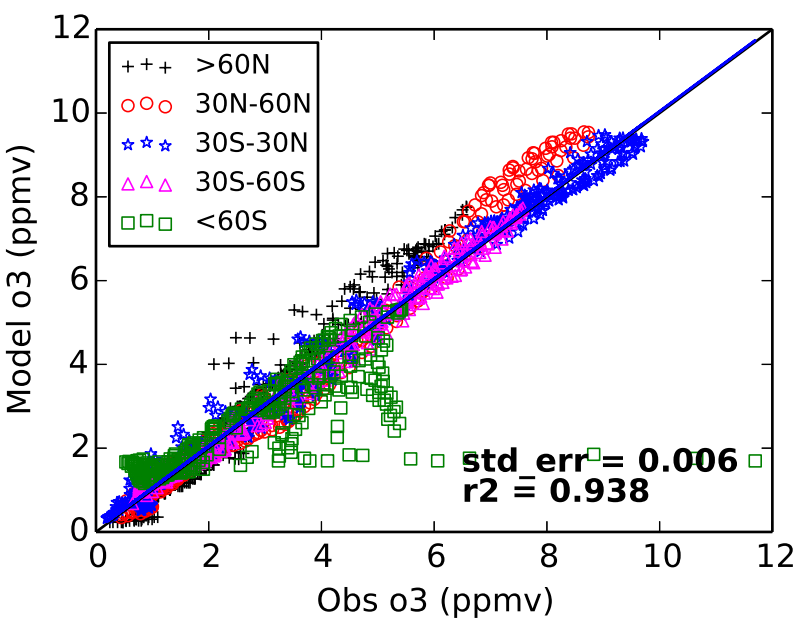
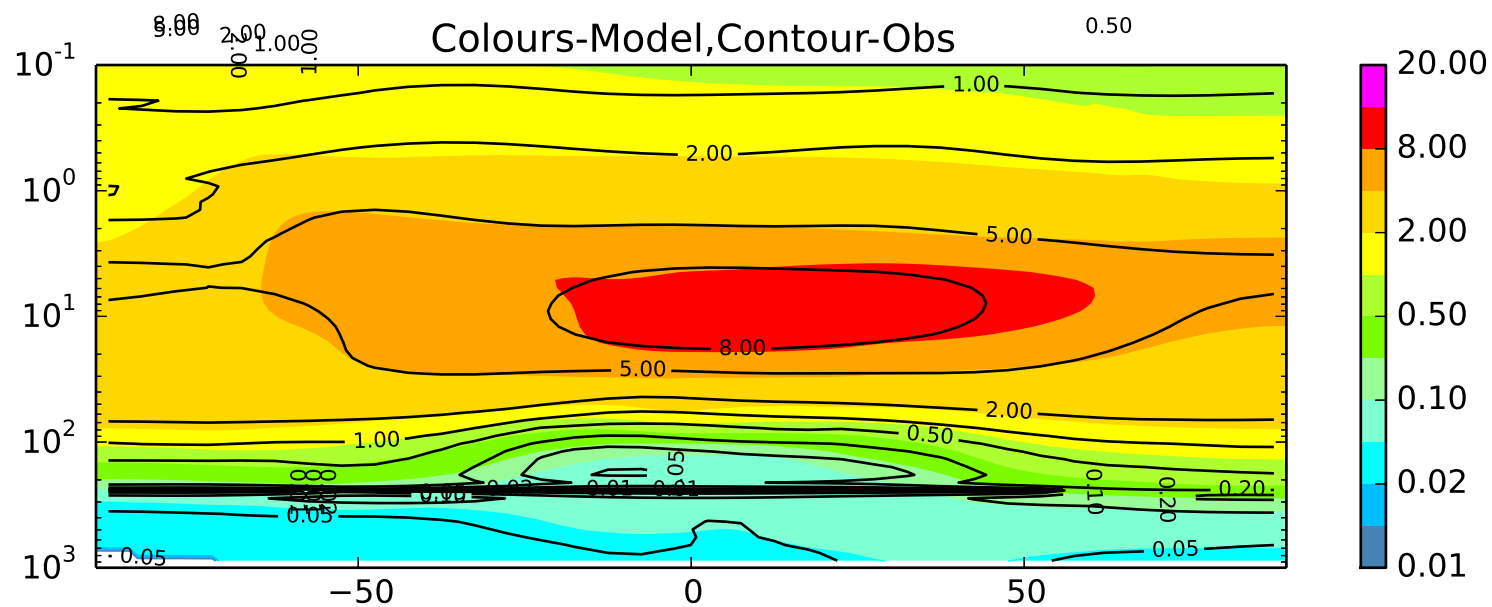
UKCA vs HALOE:
O3 (ppmv) Jan



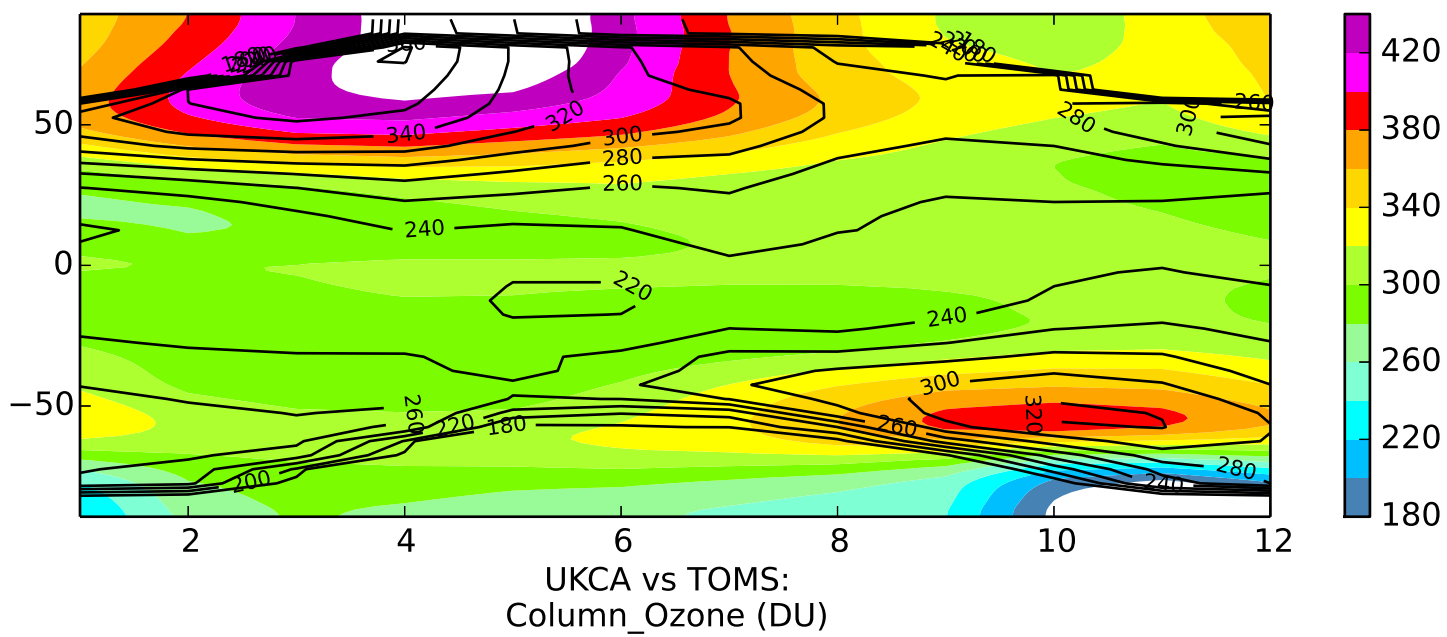
UKCA vs HALOE:
O3 (ppmv) Jul



UKCA vs NIWA-CCMVal:
O3 (ppmv) Jan

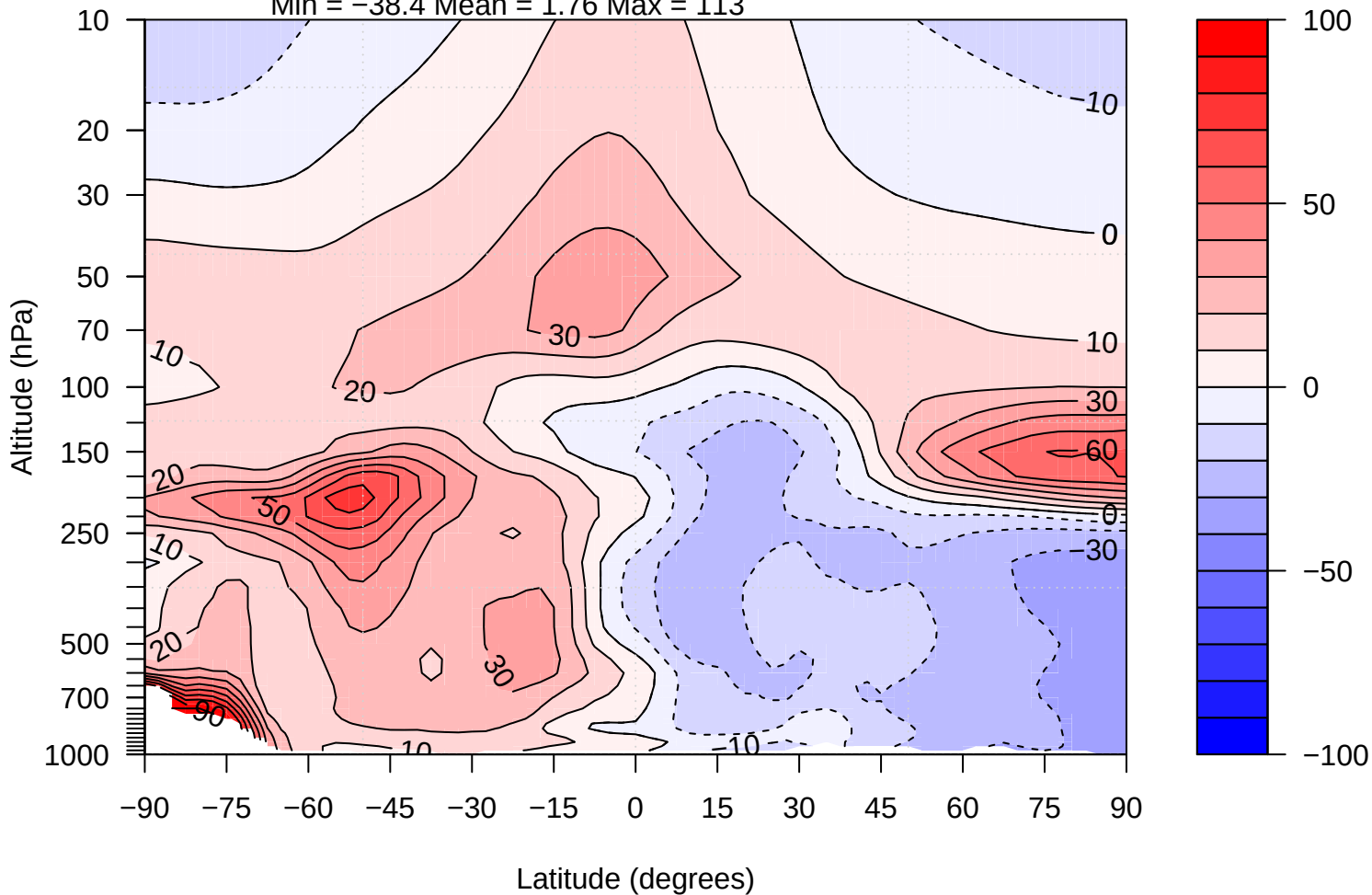


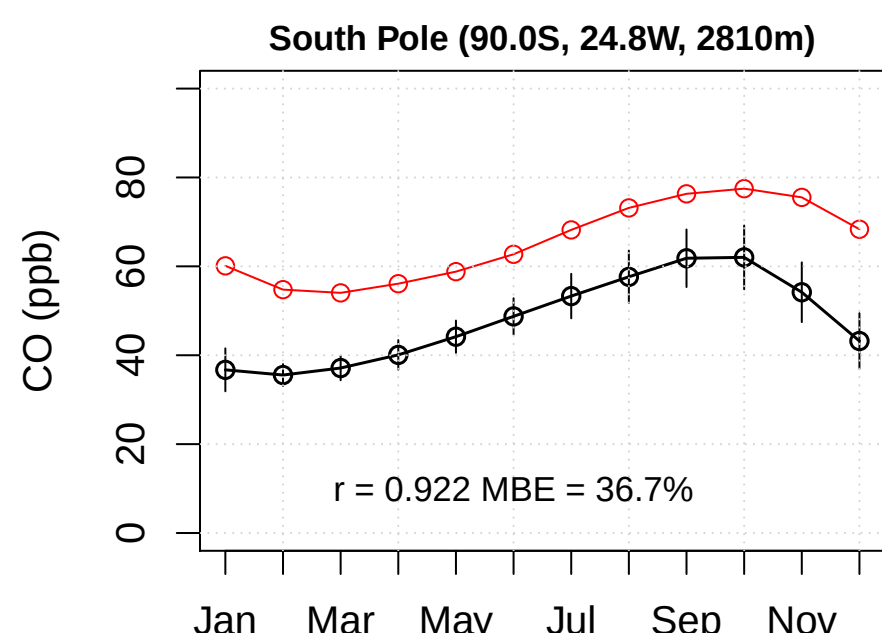
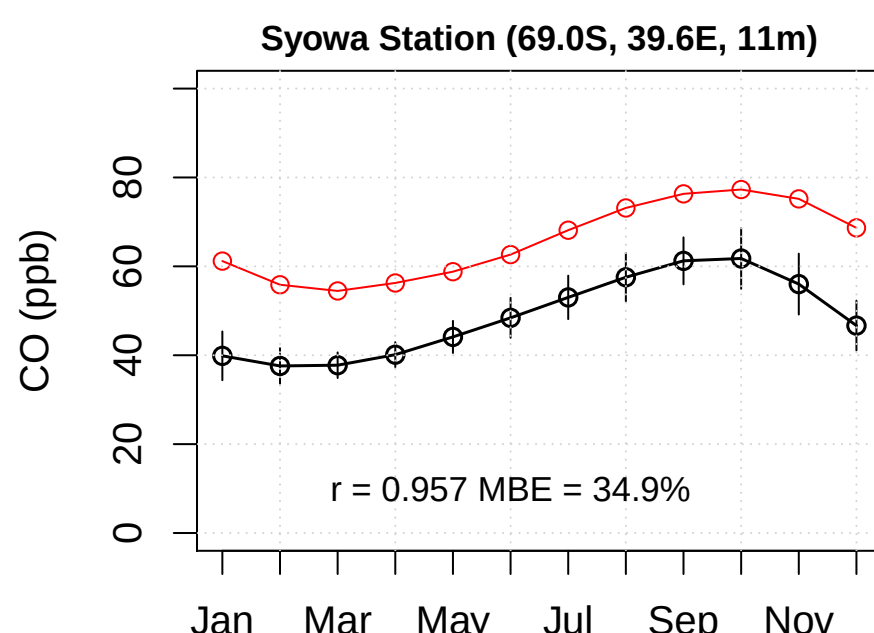
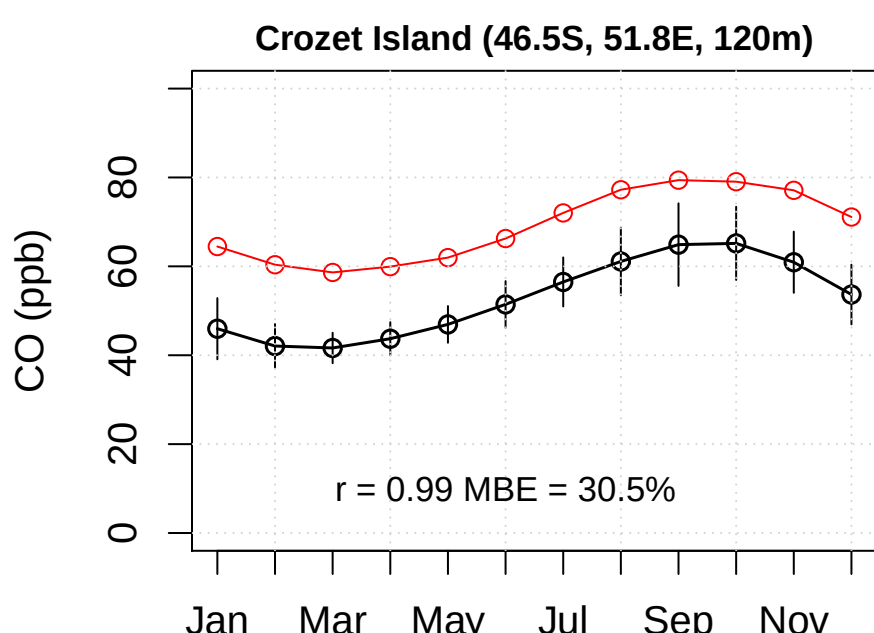
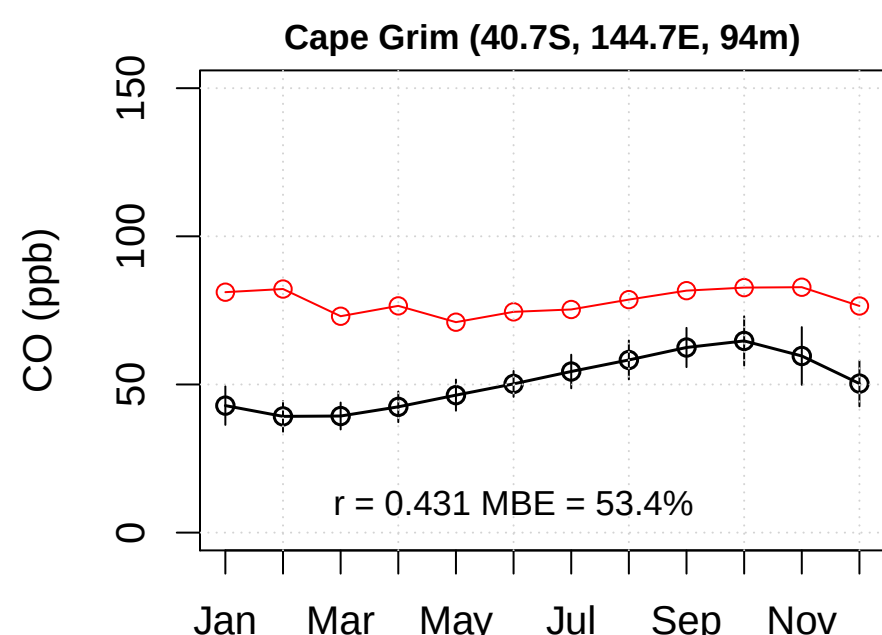
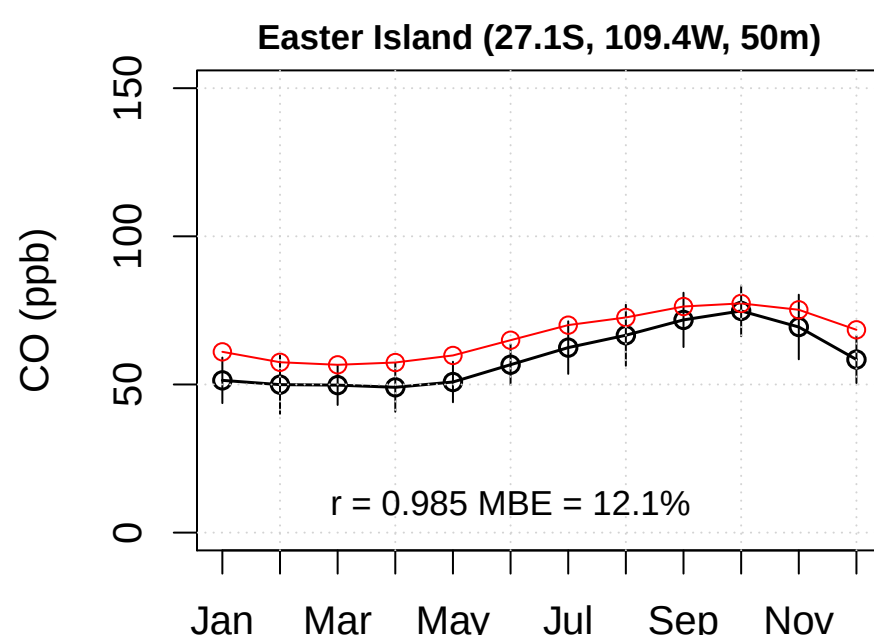
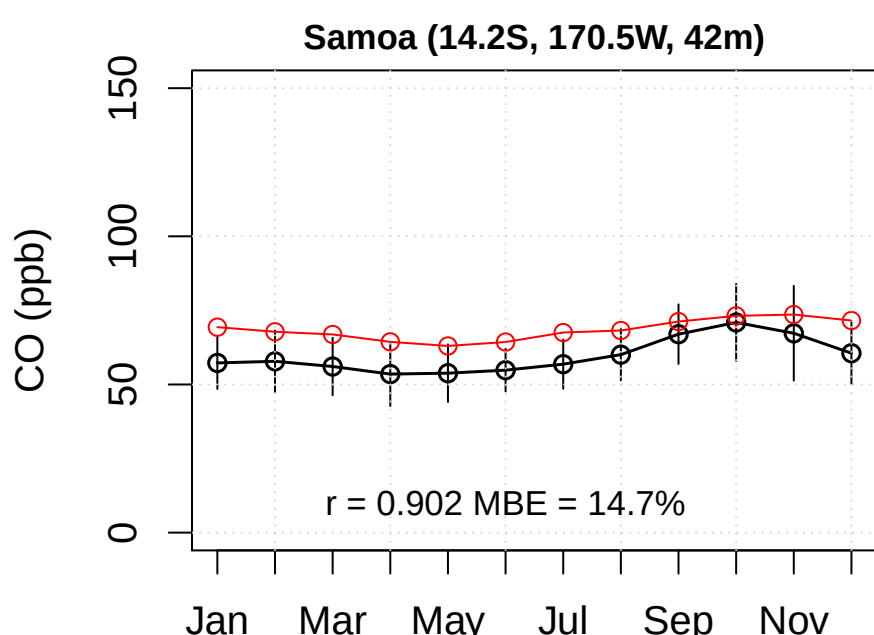
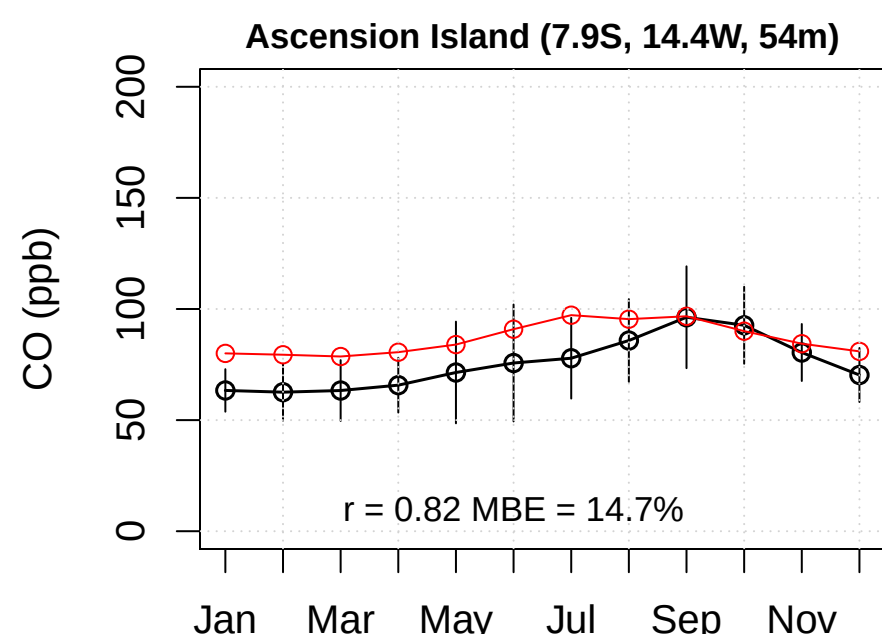
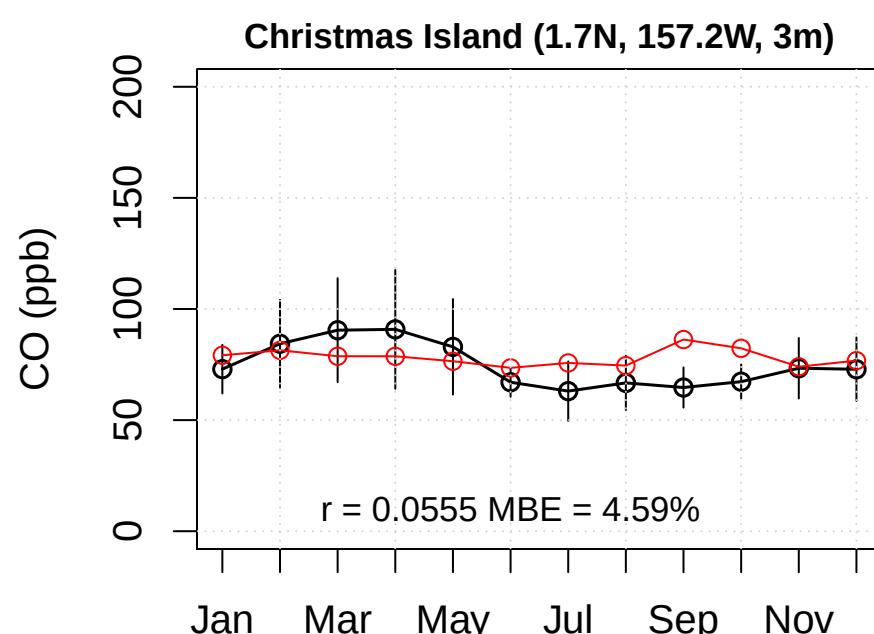
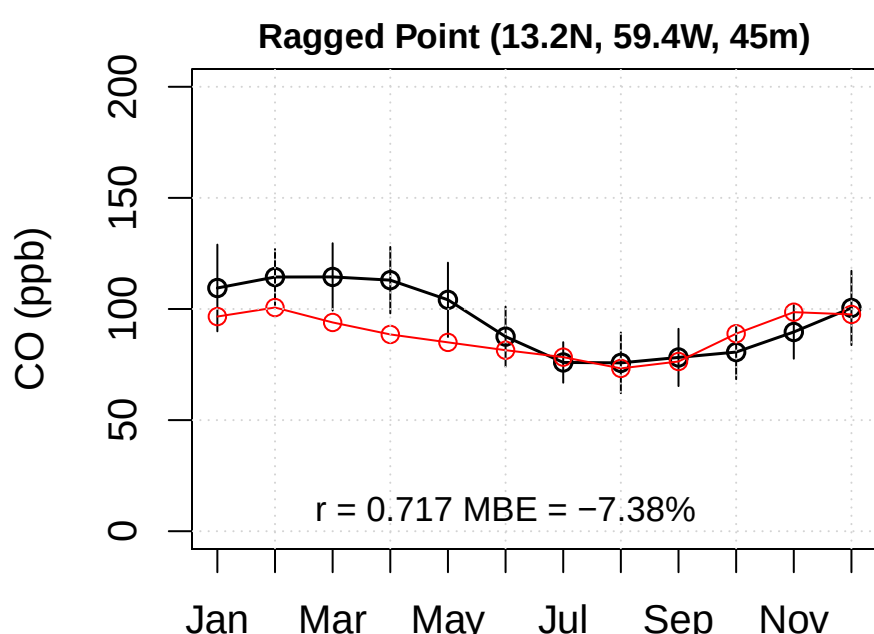
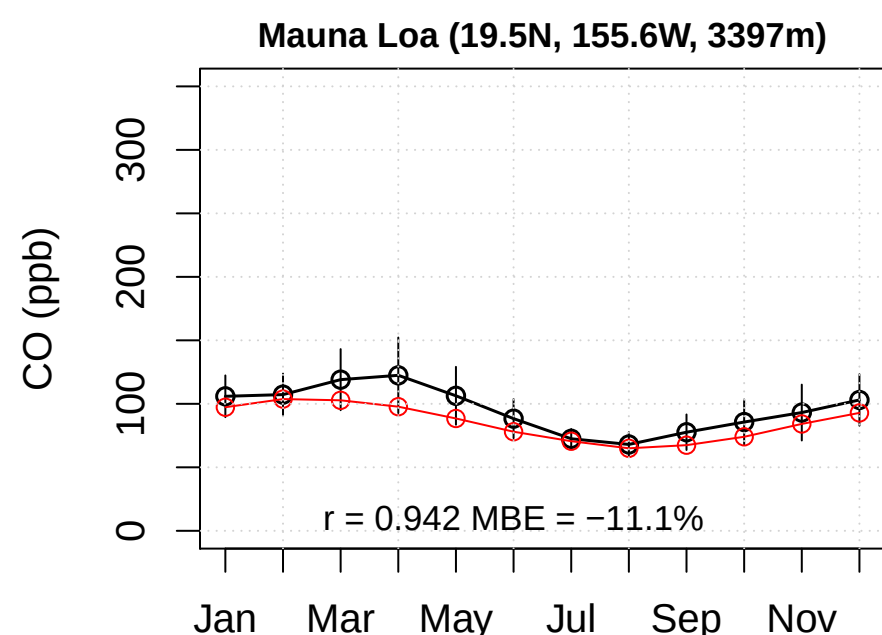
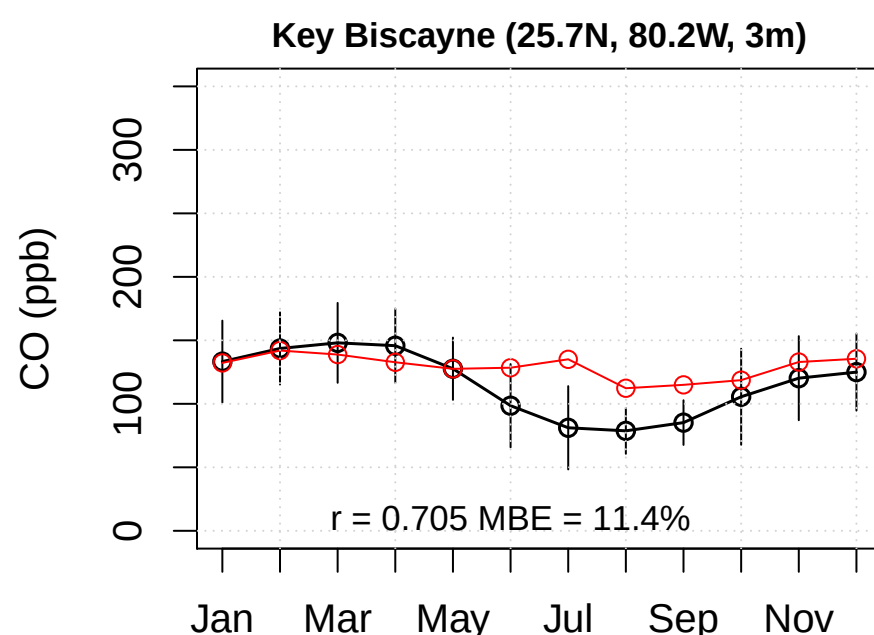
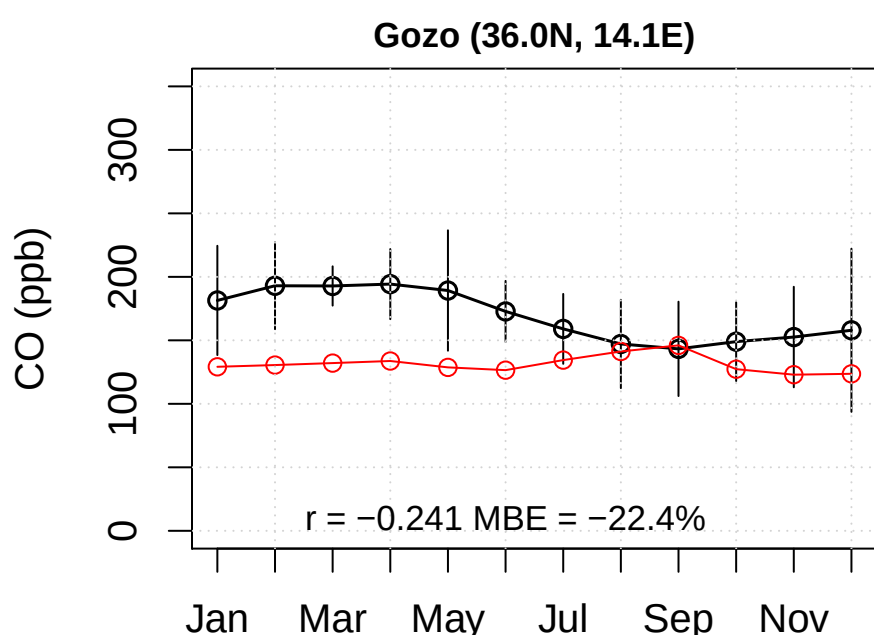
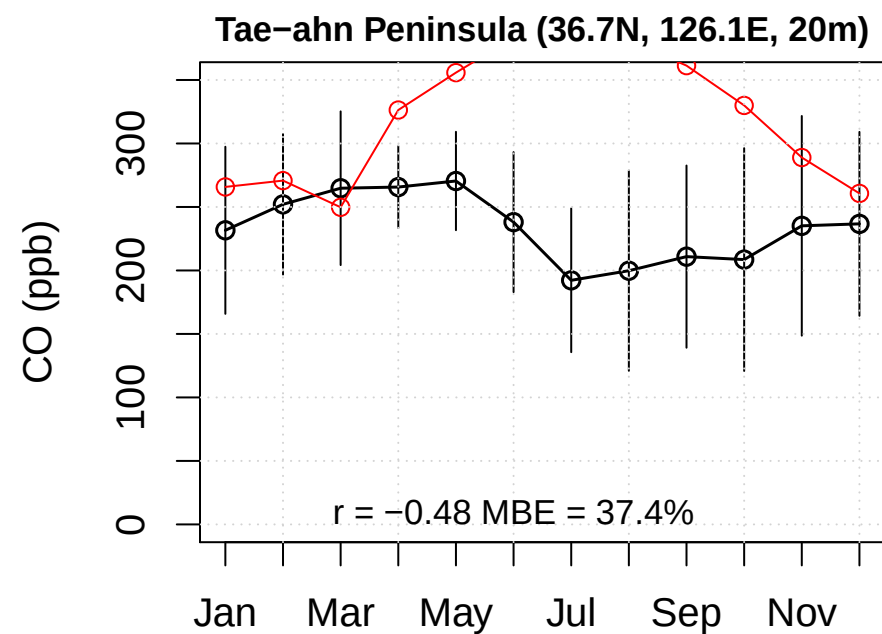
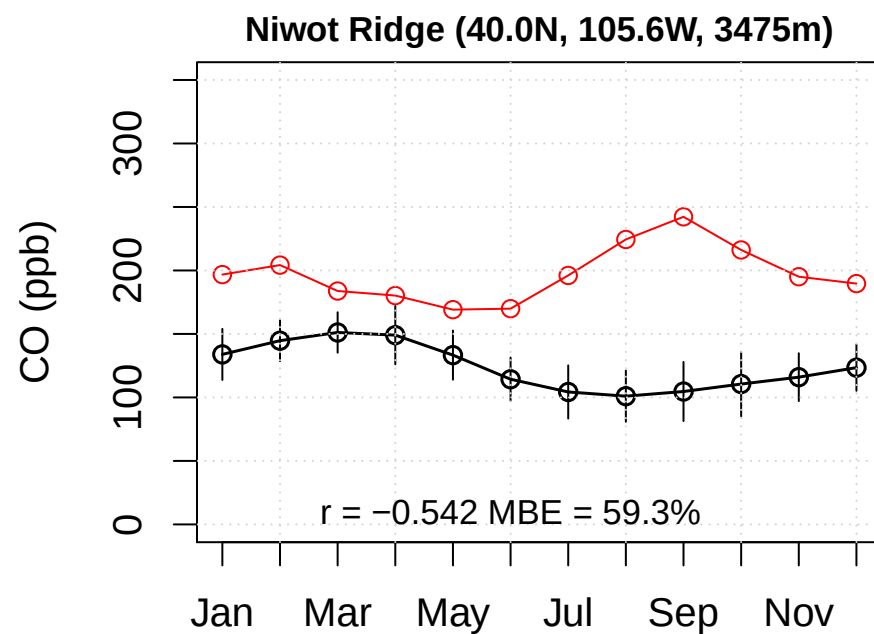
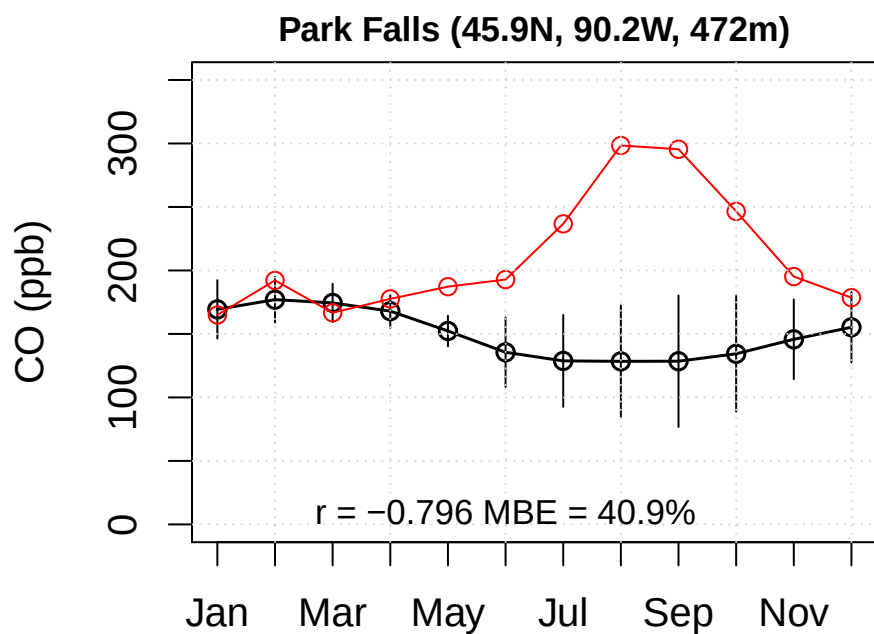
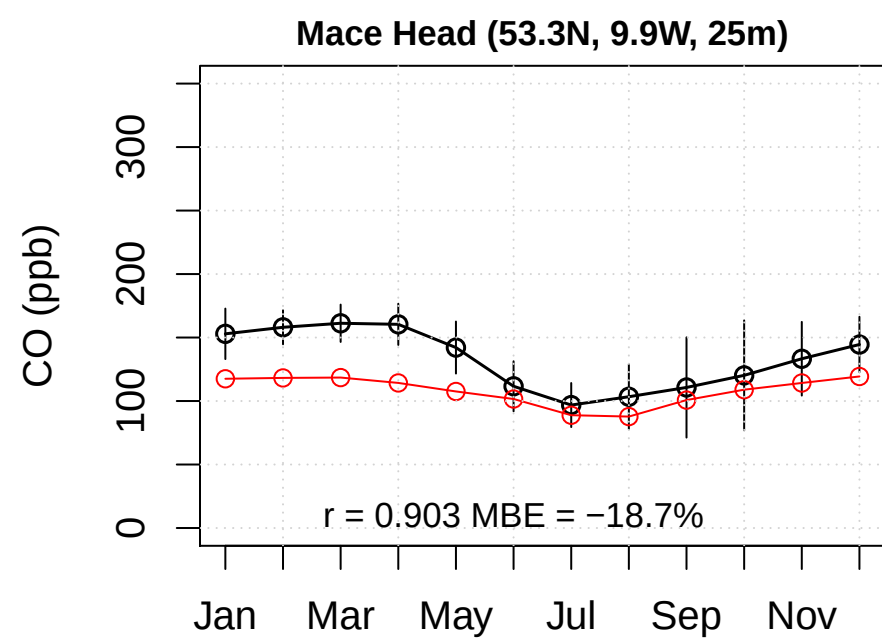
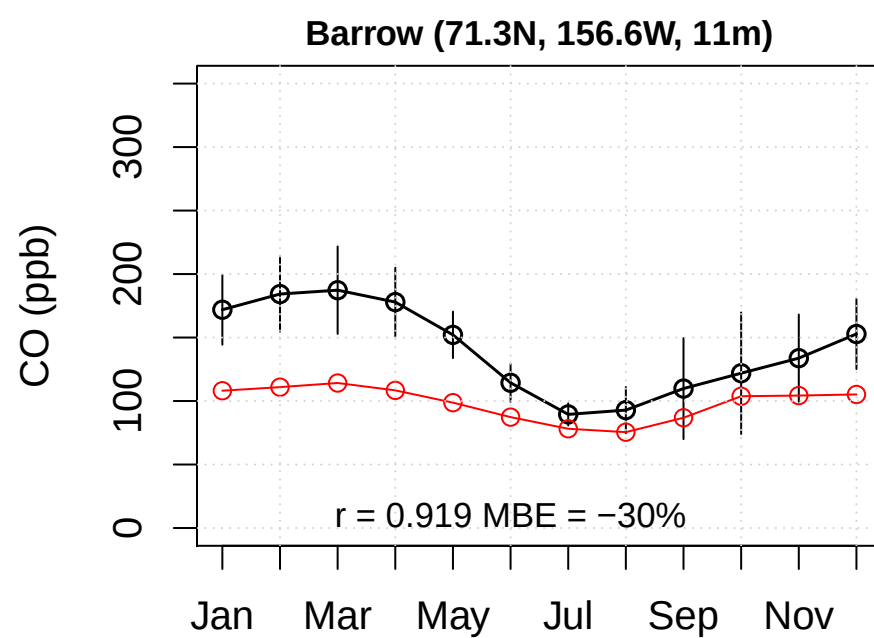
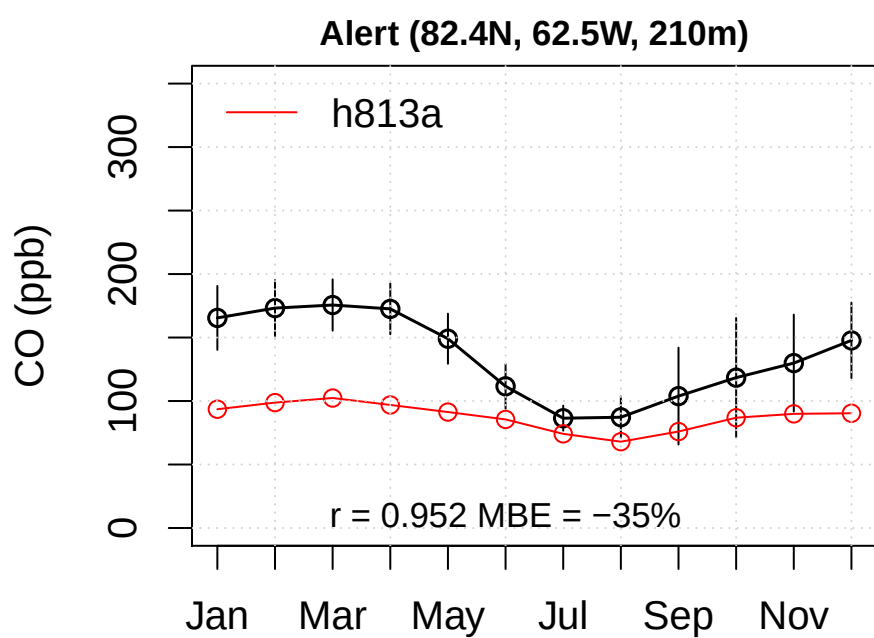
UKCA vs NIWA-CCMVal:
O3 (ppmv) Jul



h813a - ERA Q bias

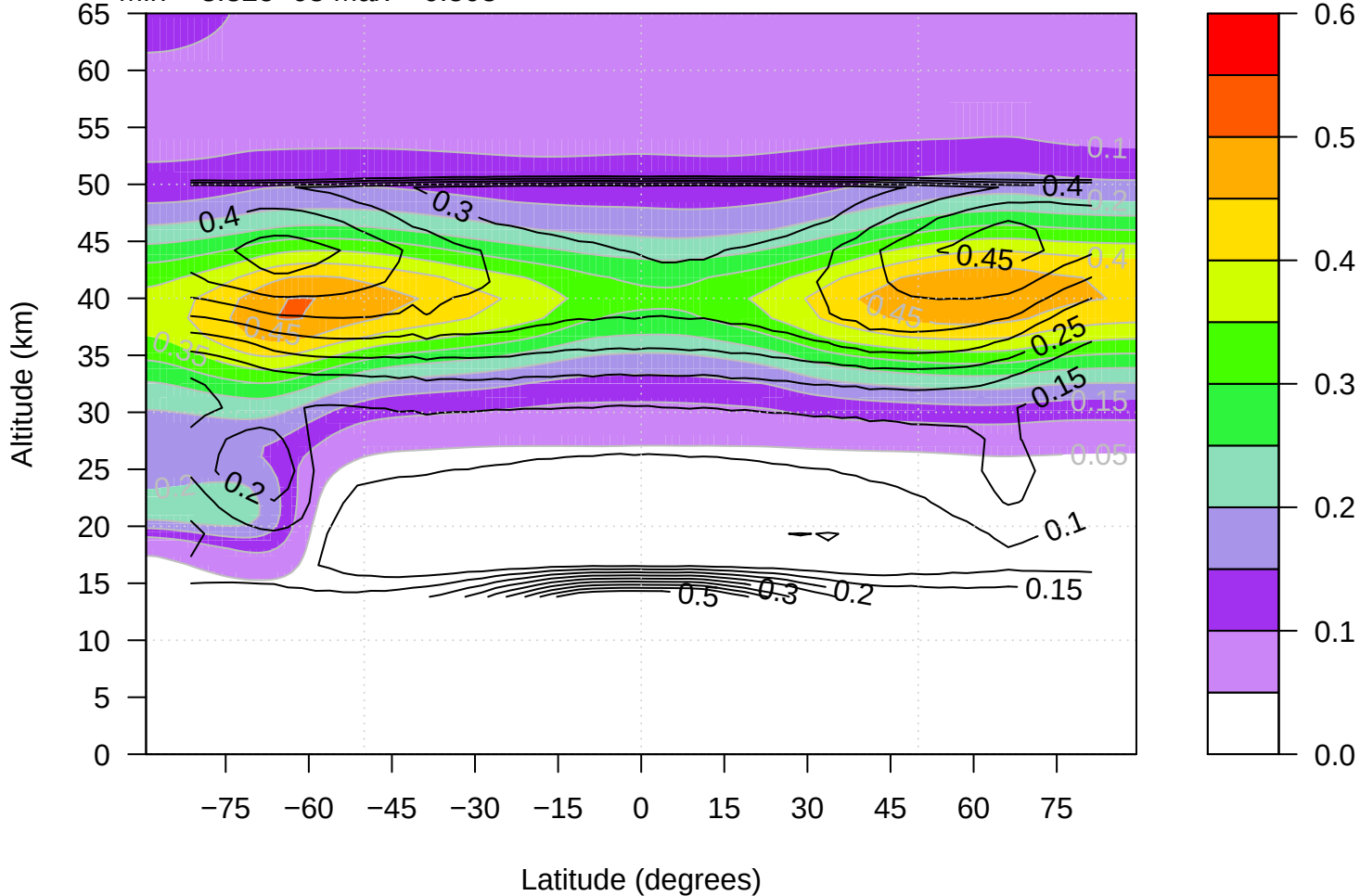
Min = -38.4 Mean = 1.76 Max = 113





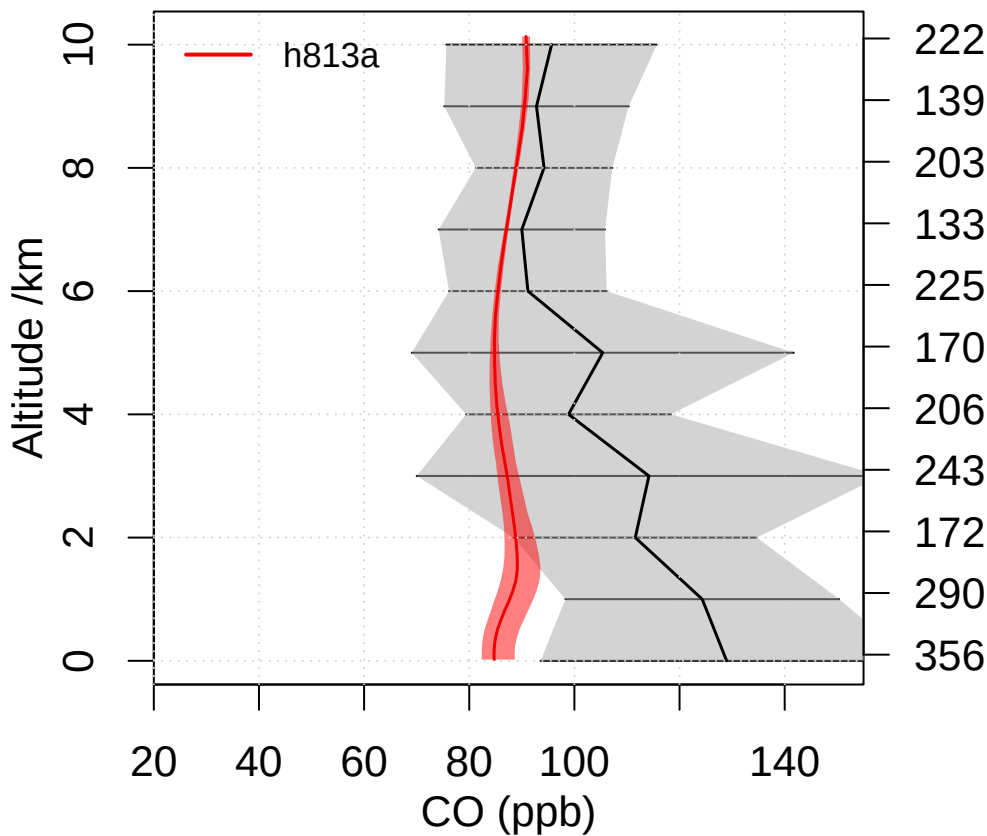
MLS – UKCA h813a ClO comparison

Min = $3.32\text{e-}08$ Max = 0.503

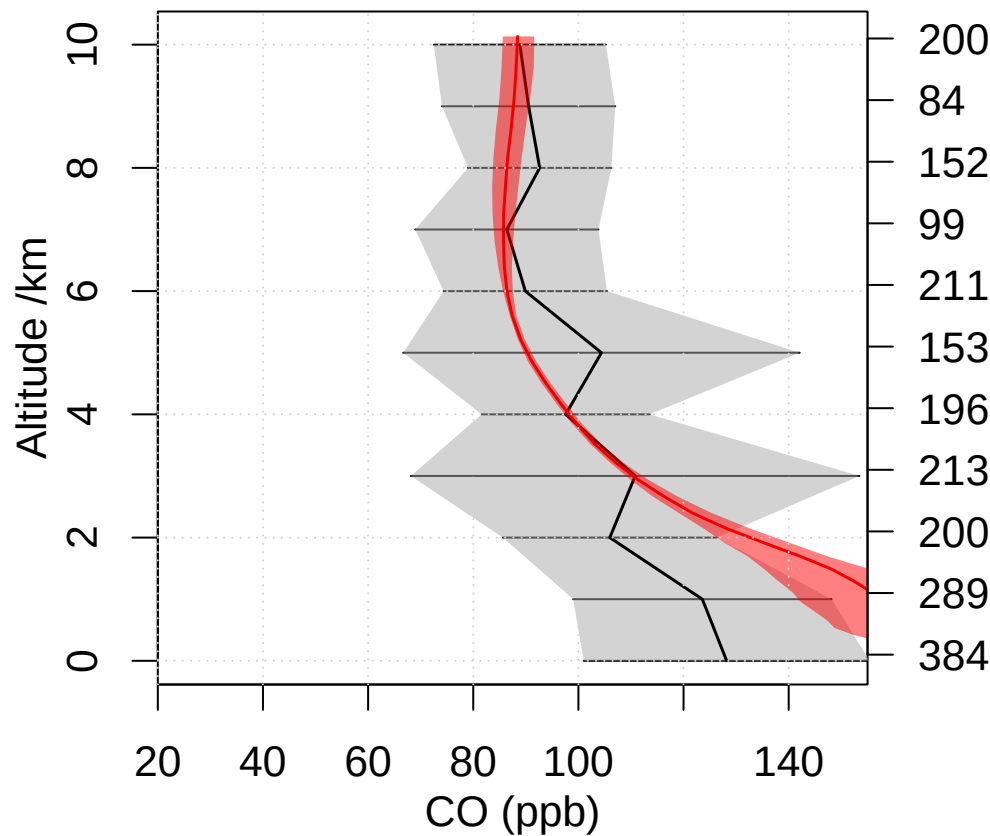


Emmons CO comparison

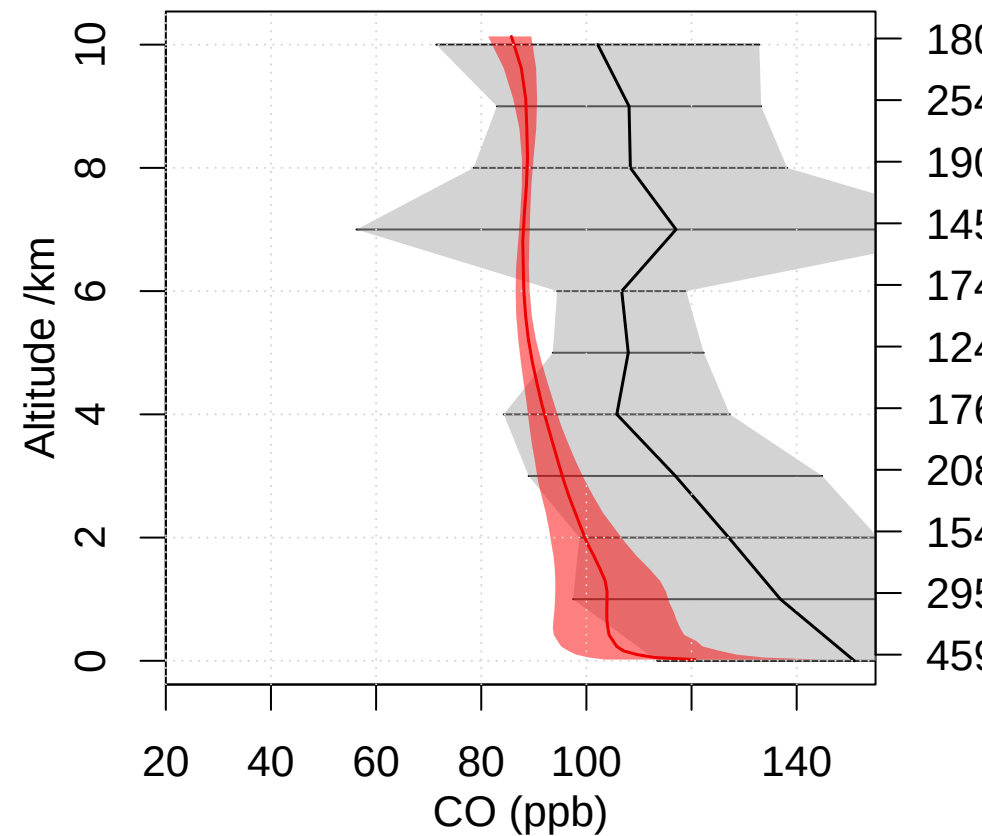
INTEX-NA East Coast 2004 07
Lat 32.5 – 40 Lon 296.5 – 307



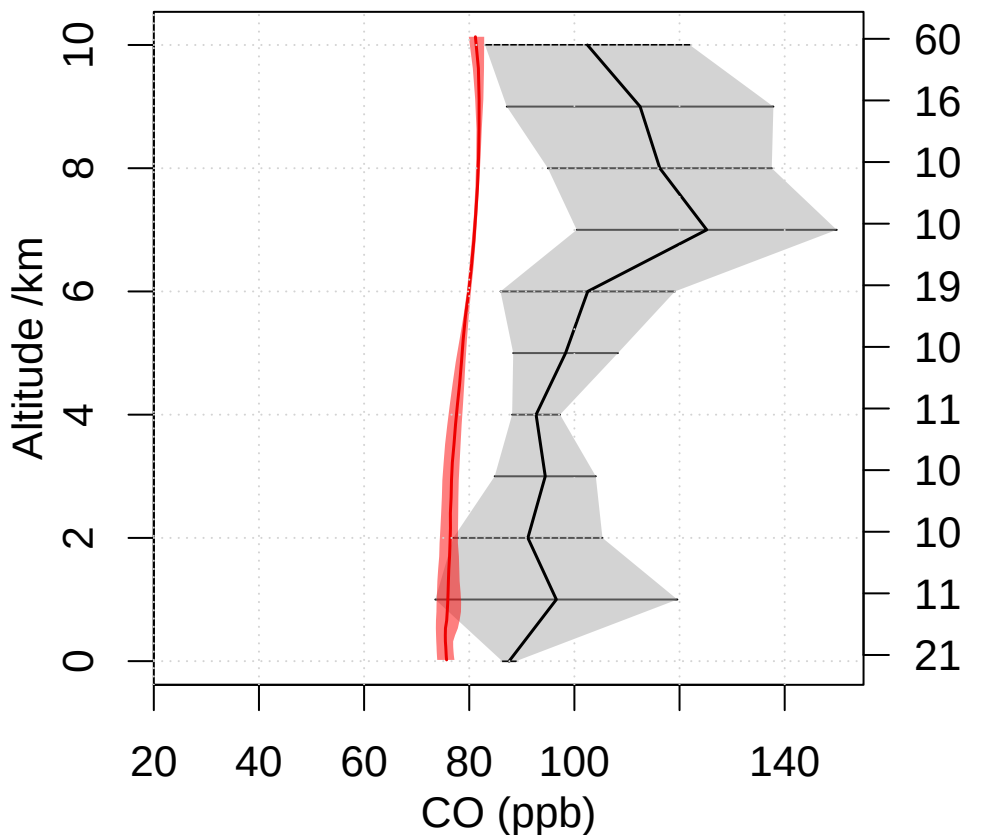
INTEX-NA Central 2004 07
Lat 30 – 40 Lon 259.5 – 285



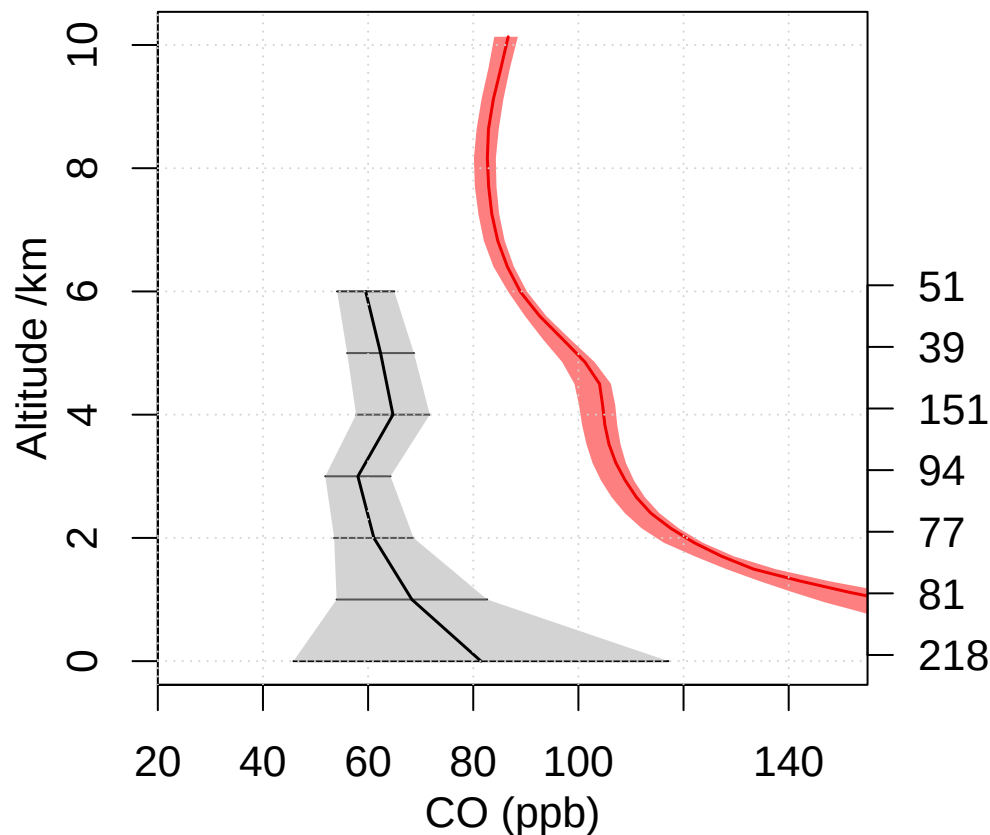
INTEX-NA North East 2004 07
Lat 42.5 – 52.5 Lon 285 – 310



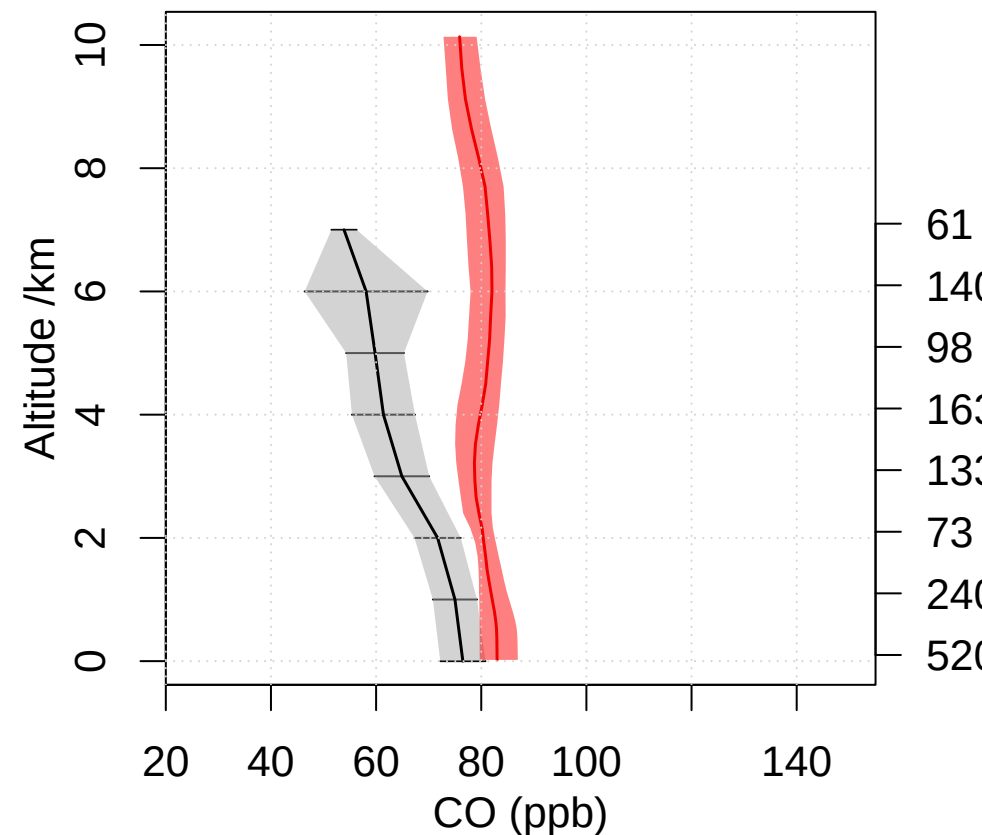
INTEX-NA West Coast 2004 07
Lat 32.5 – 45 Lon 217 – 240



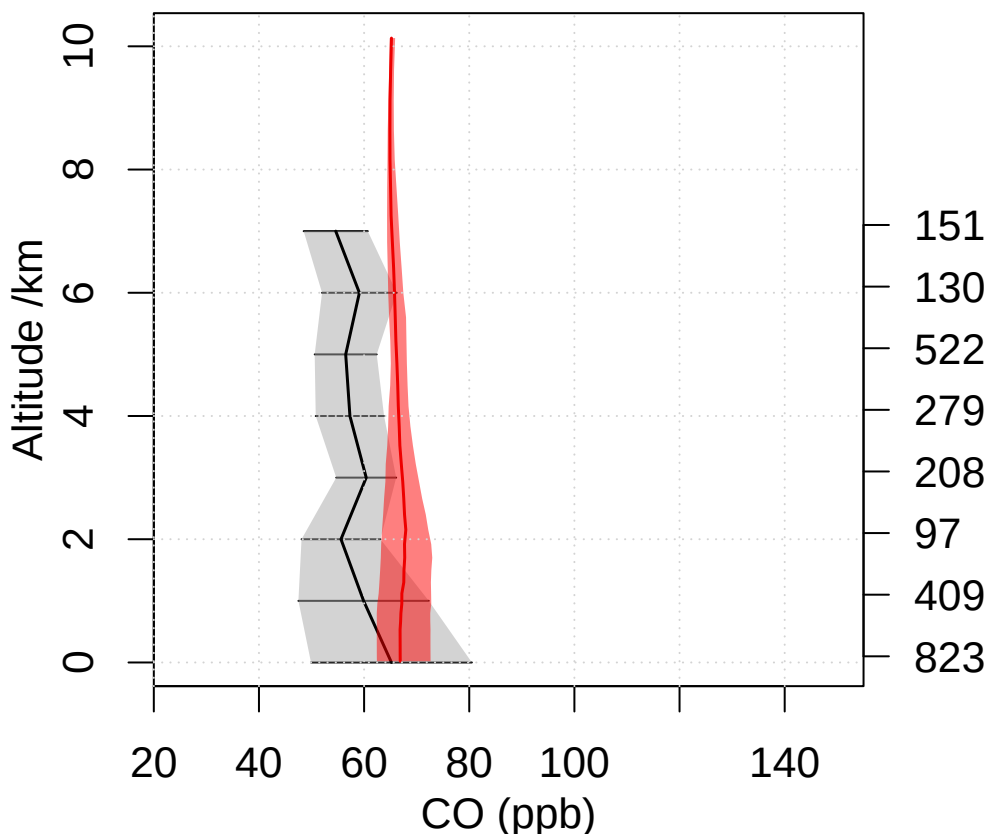
OP3 2008 07
Lat 2.5 – 7.5 Lon 112.5 – 120



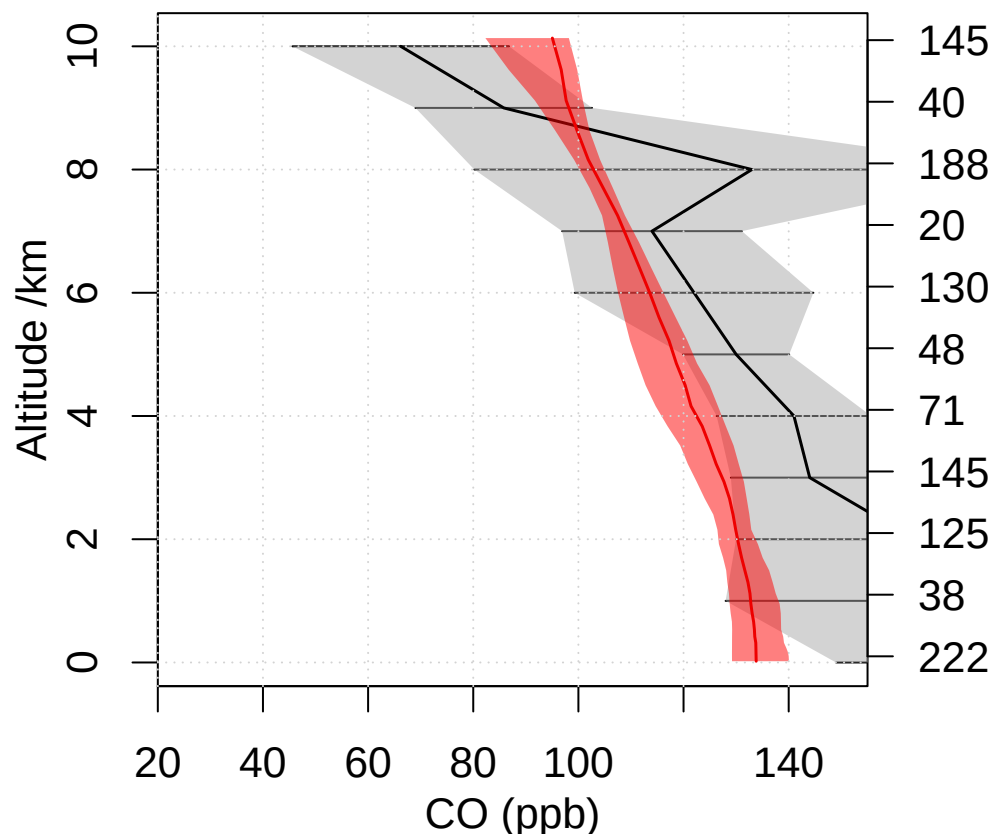
PEM-Tropics-B Christmas-Island 1999 0
Lat 0 – 10 Lon 200 – 220



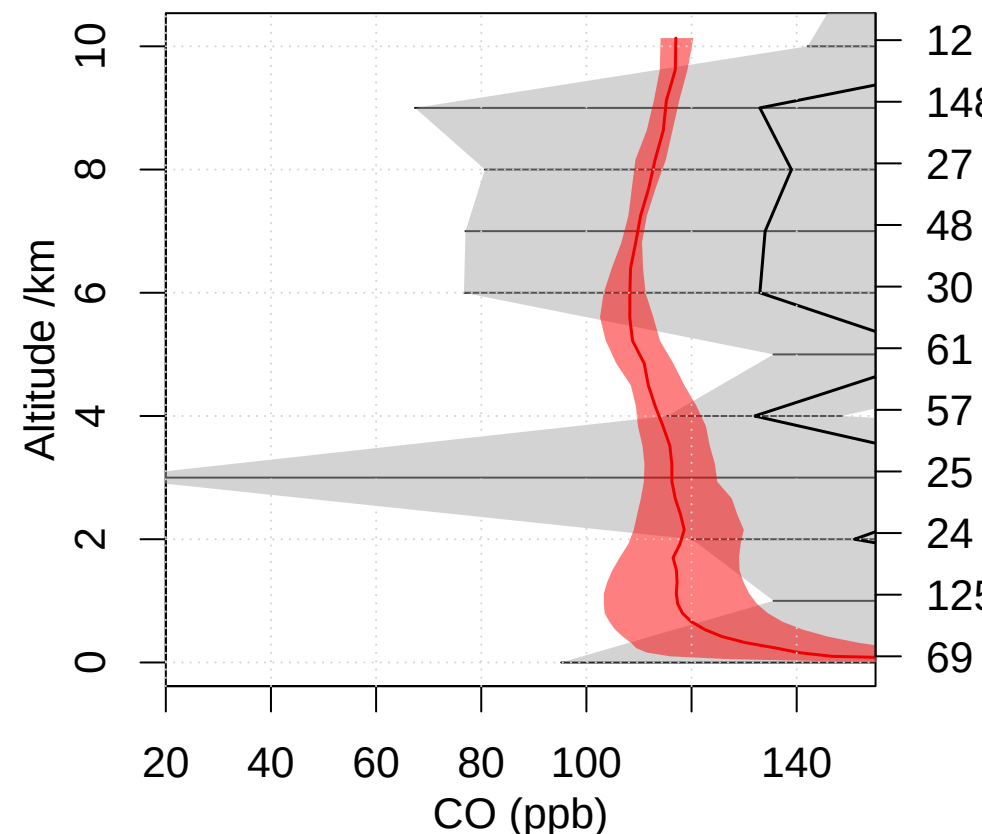
PEM-Tropics-B Tahiti 1999 03
Lat -20 – 0 Lon 200 – 230



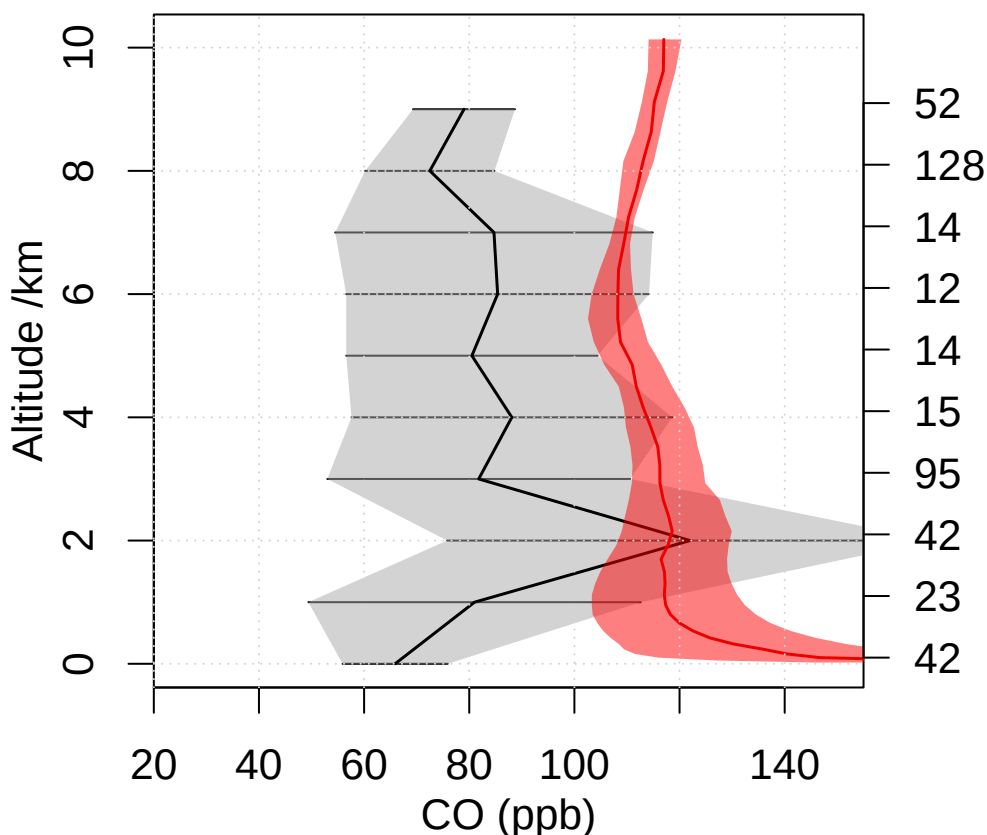
PEM-West-B Japan 1994 02
Lat 25 – 40 Lon 135 – 150



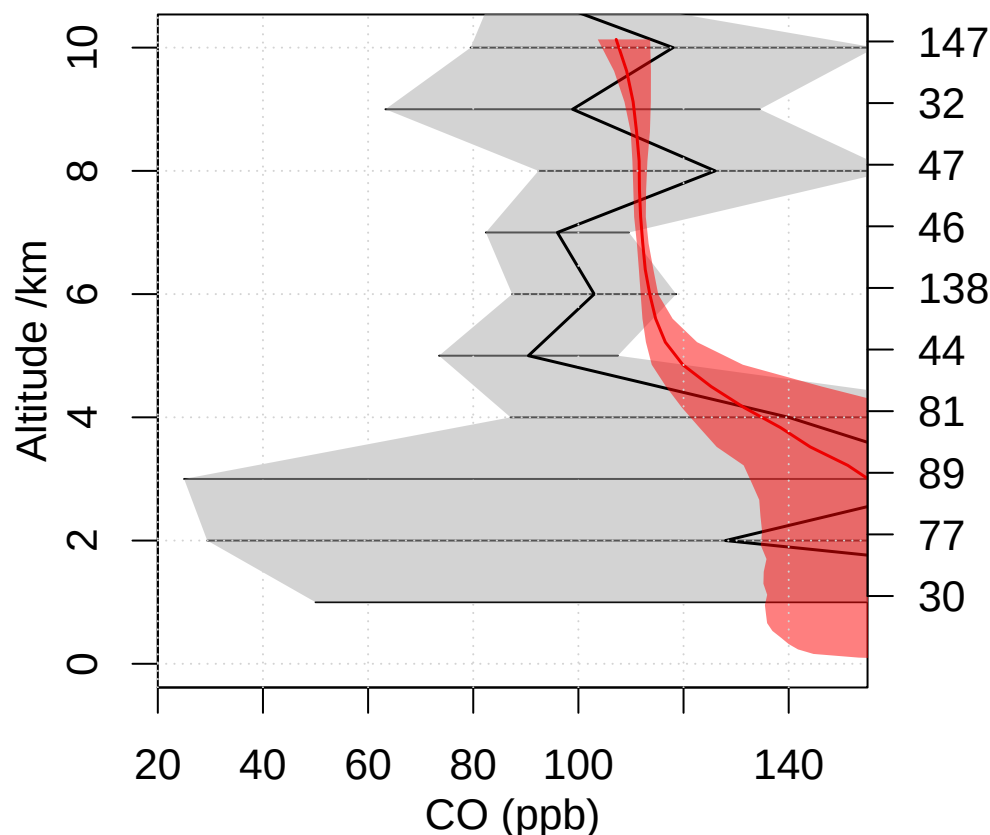
TRACE-A E-Brazil 1992 09
Lat -15 – -5 Lon 310 – 320



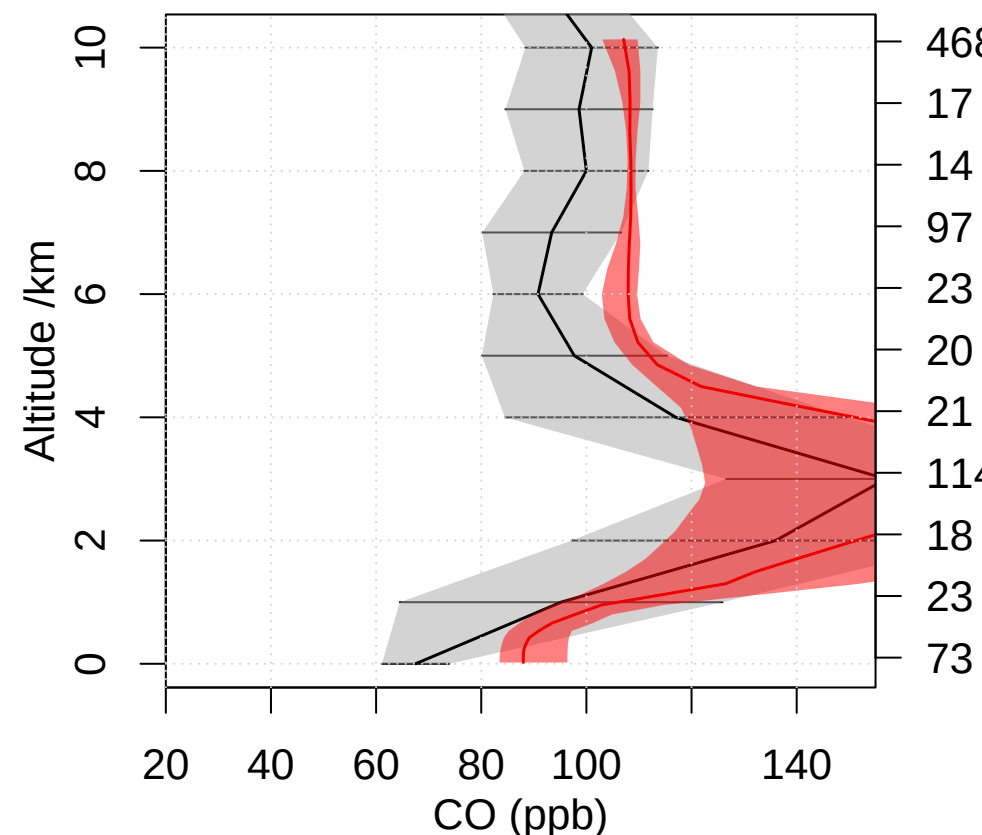
TRACE-A E-Brazil Coast 1992 09
Lat -35 – -25 Lon 310 – 320



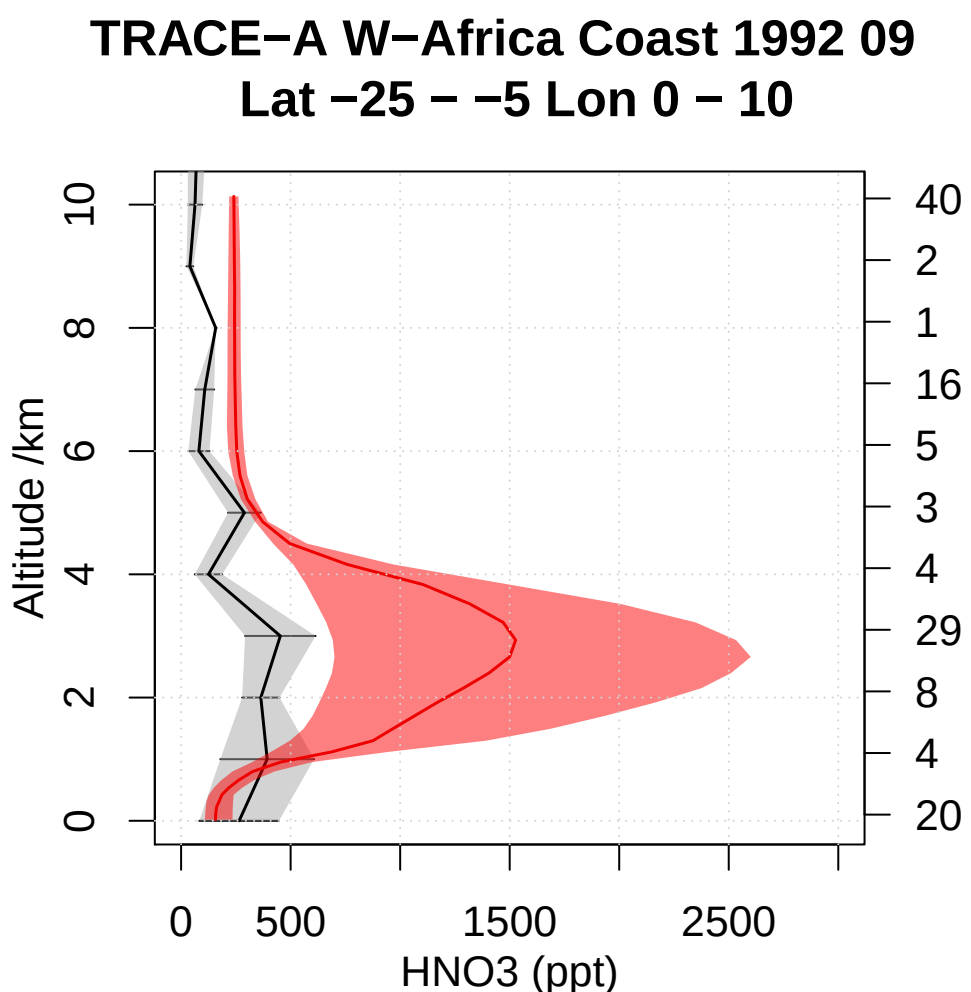
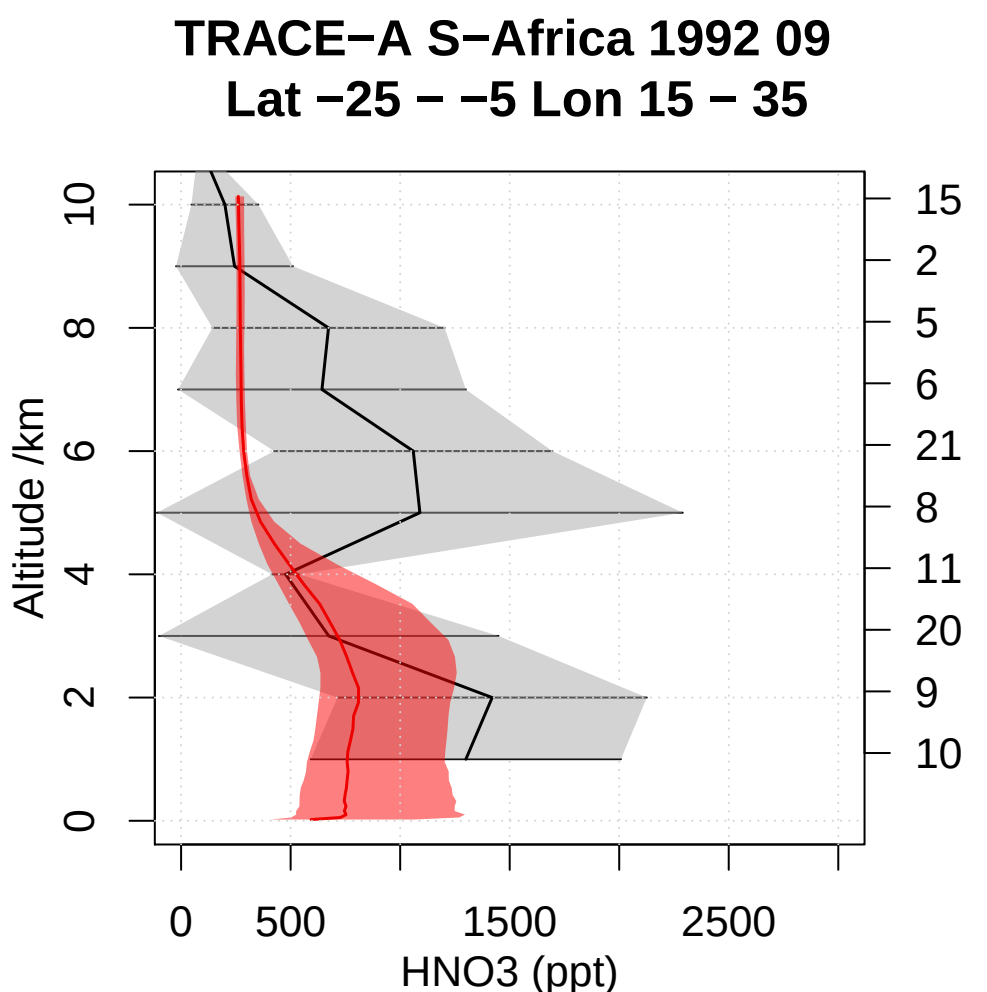
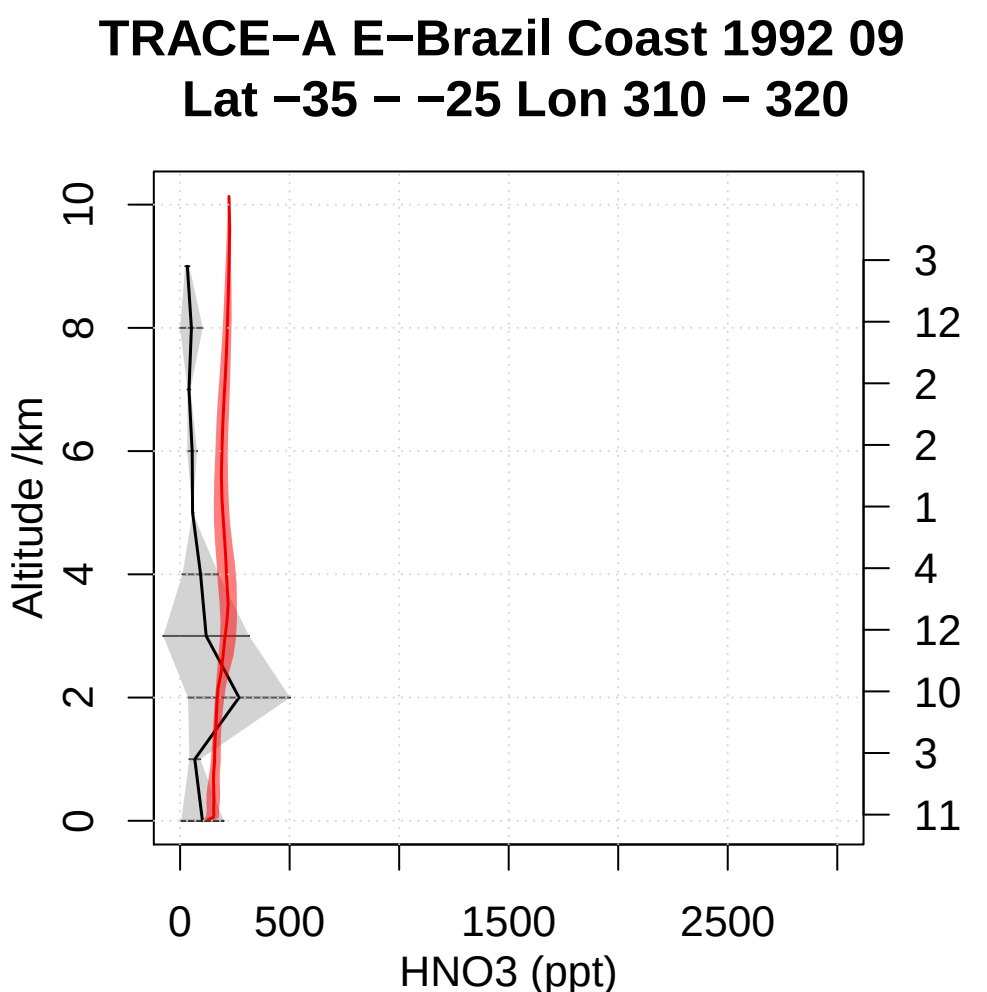
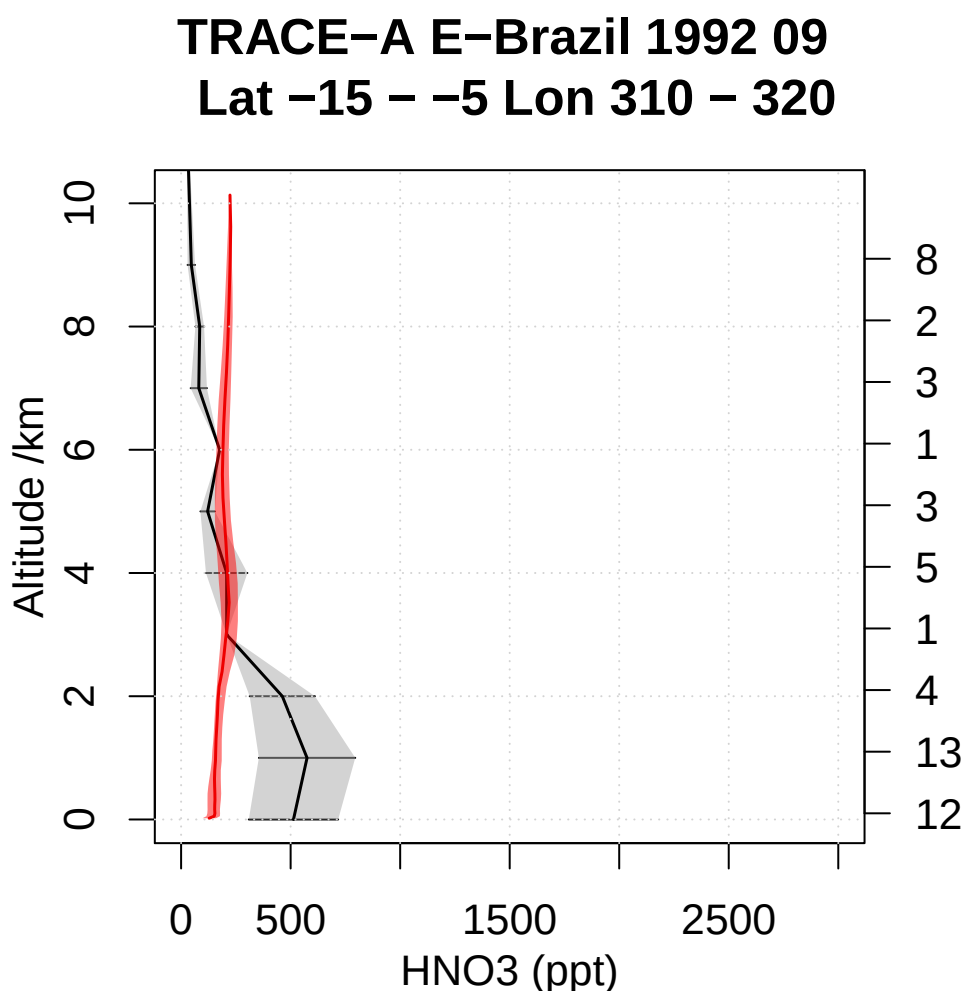
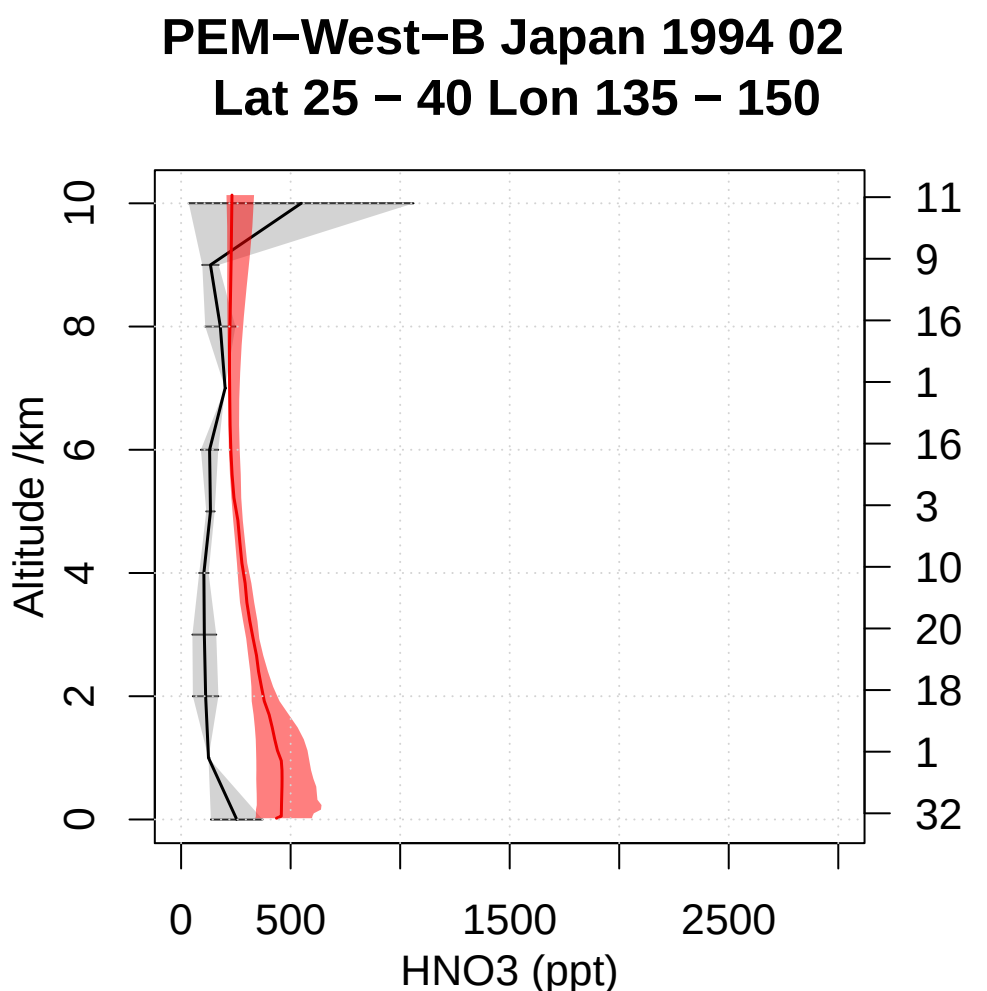
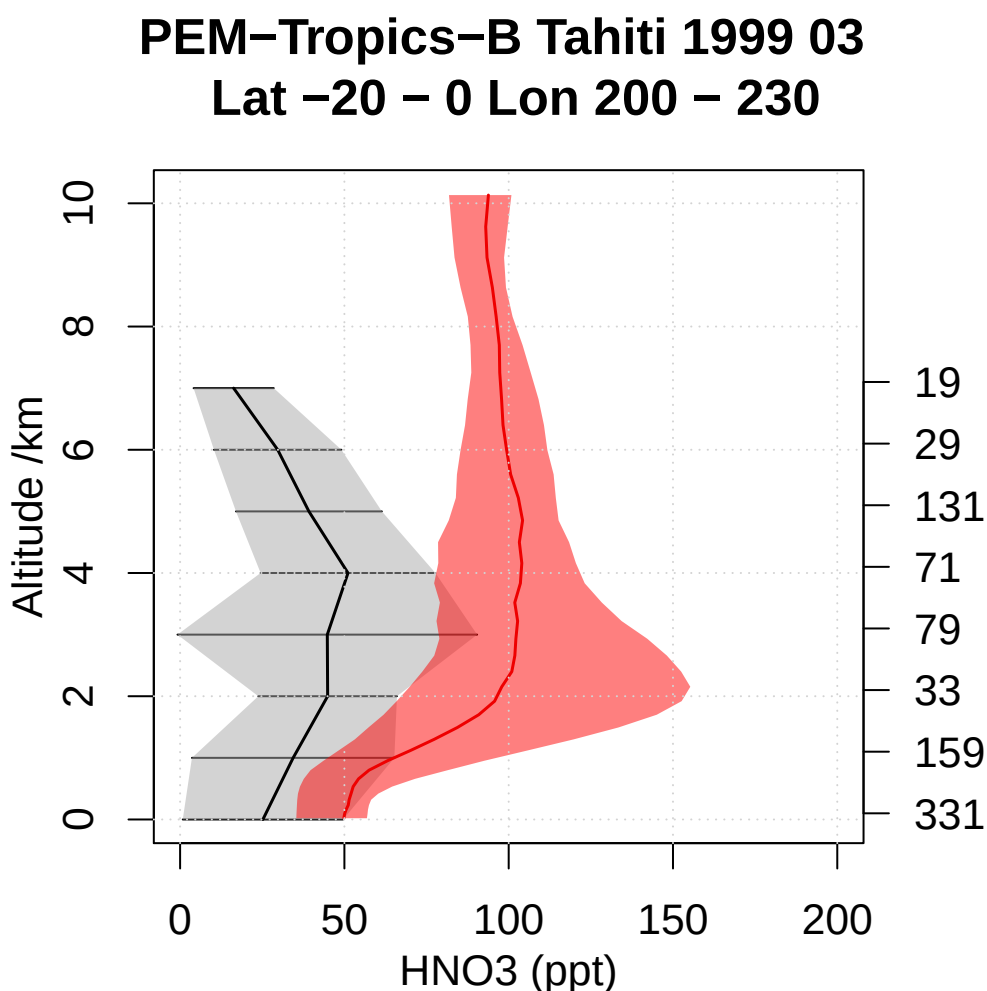
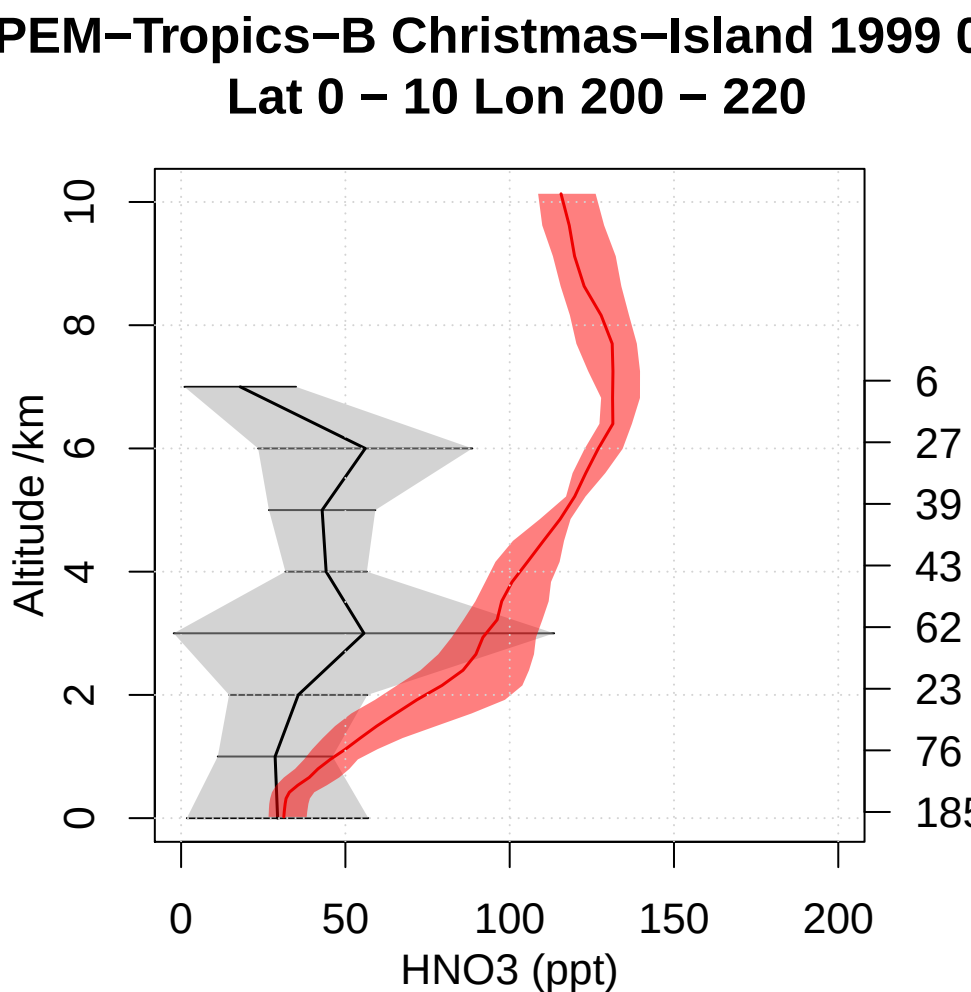
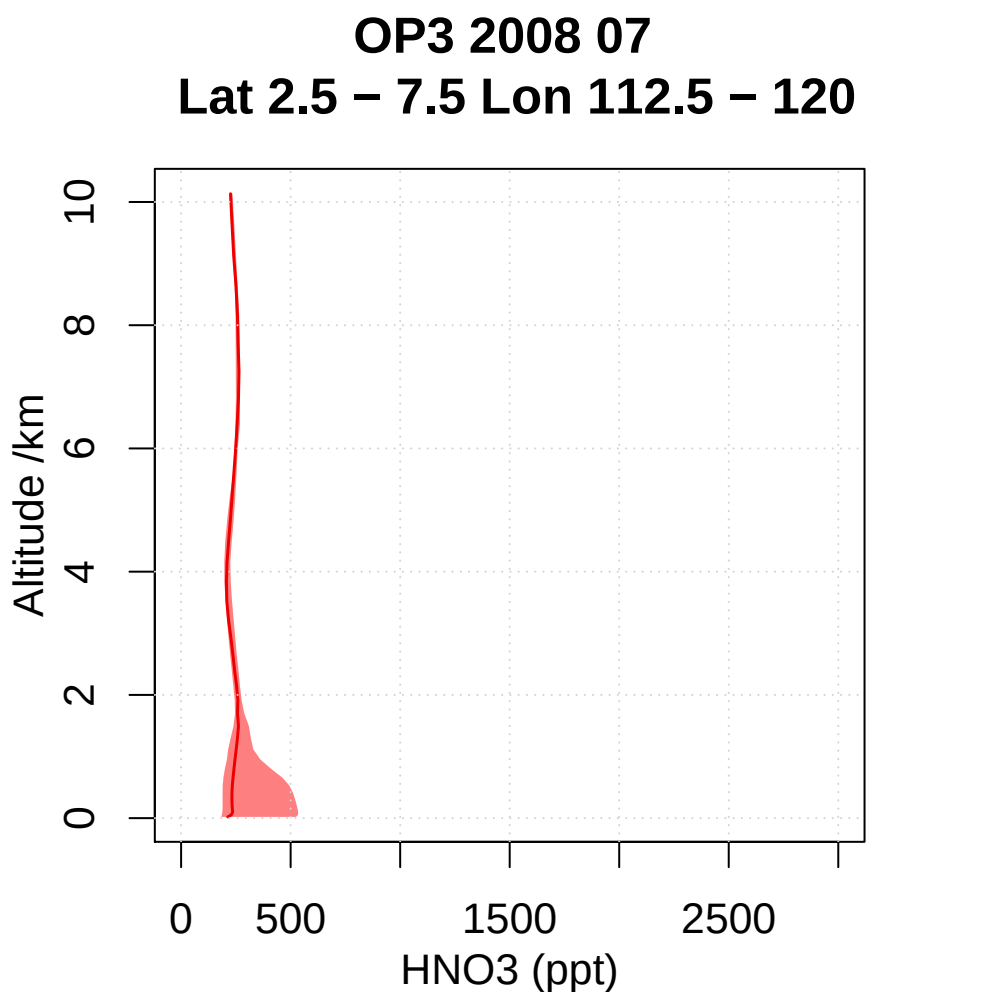
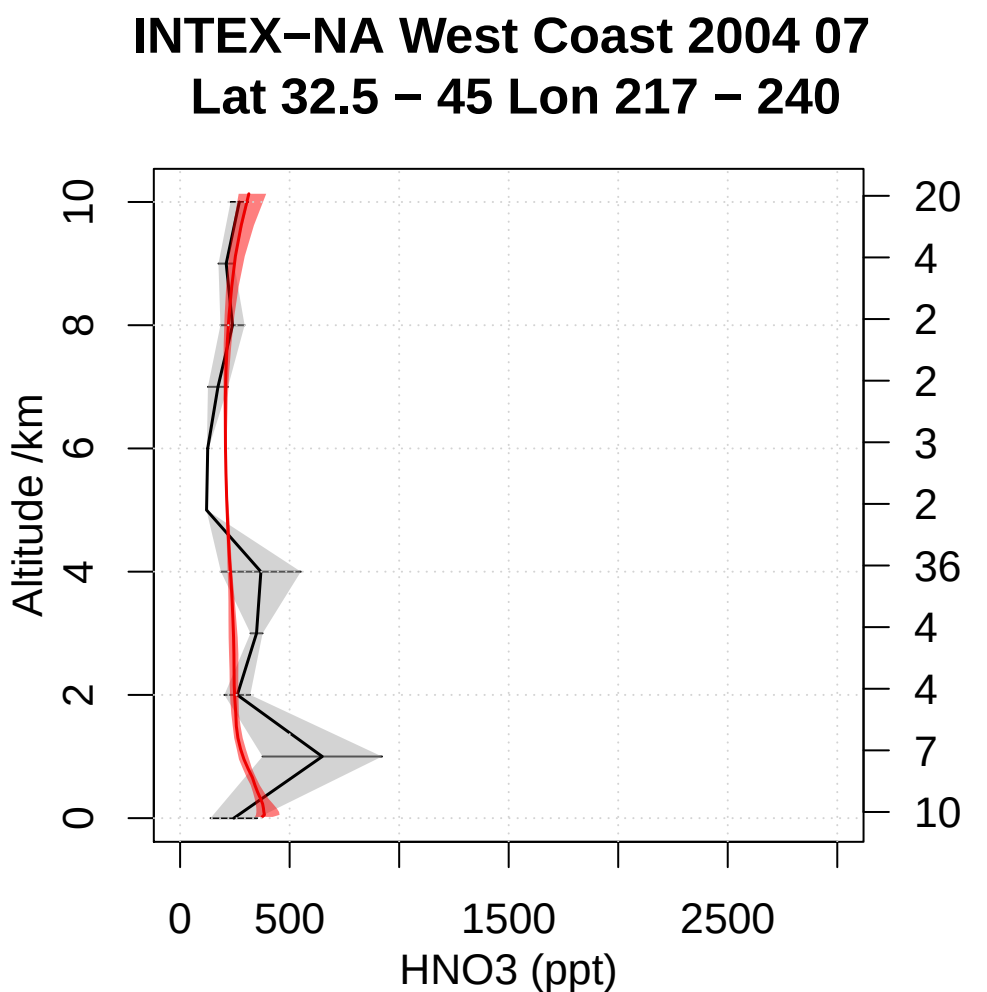
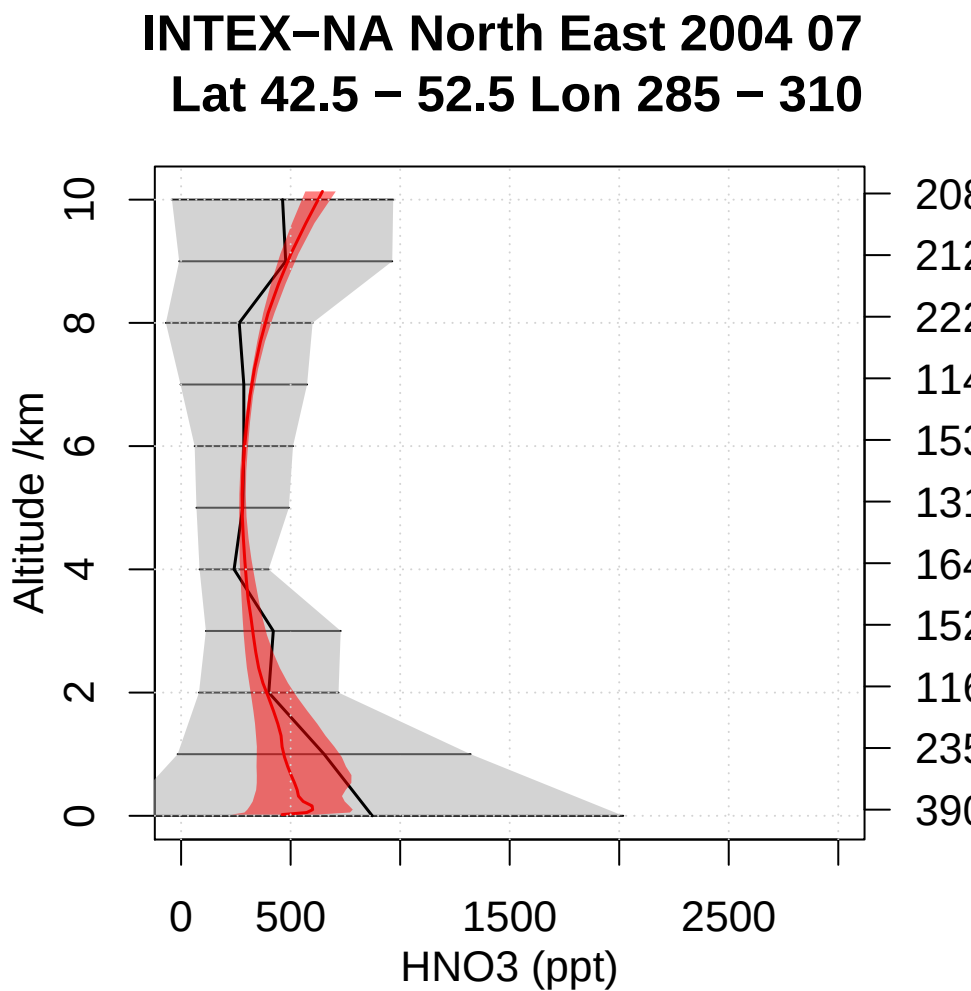
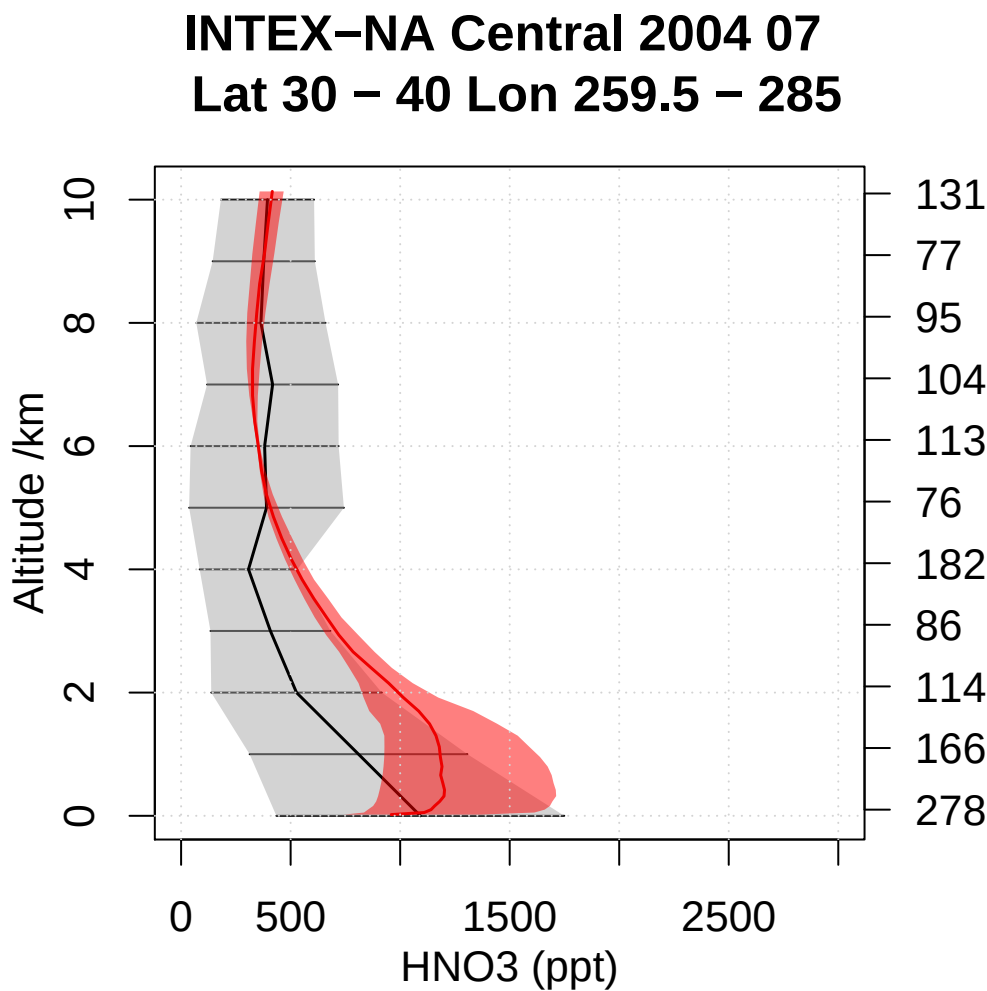
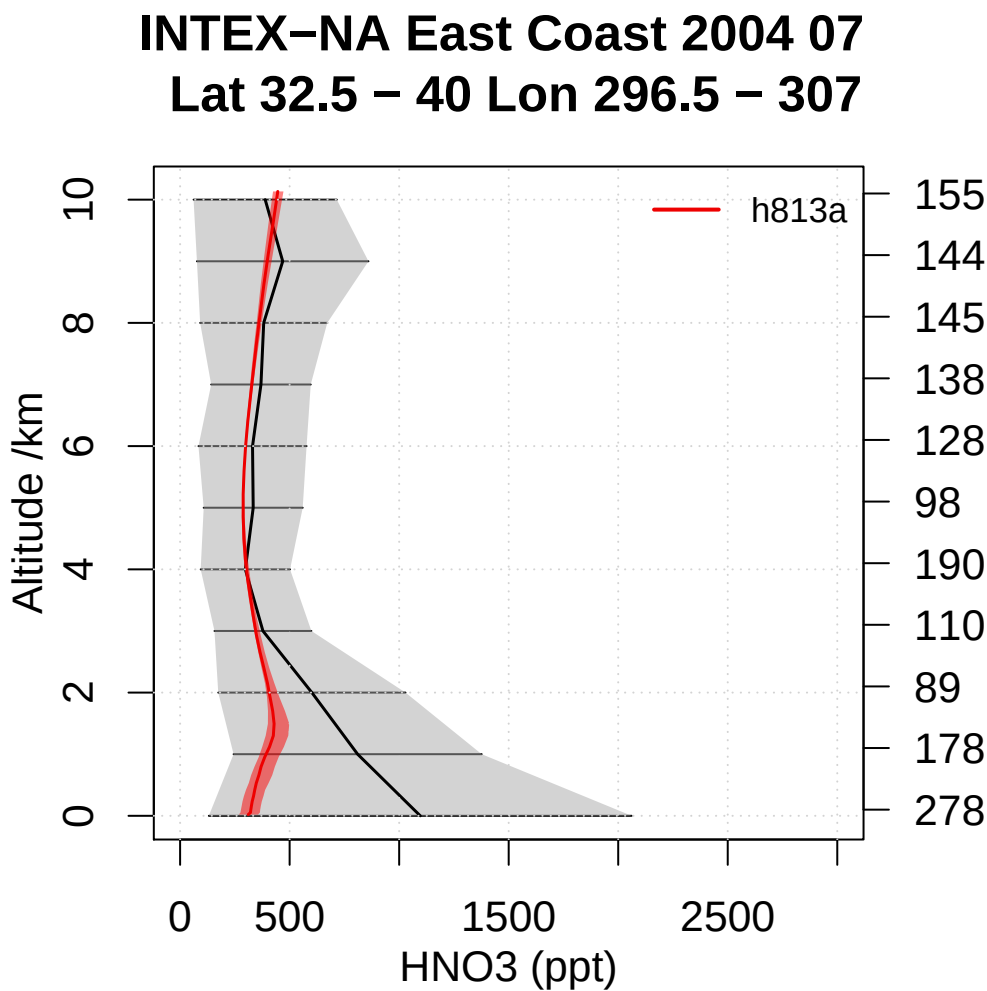
TRACE-A S-Africa 1992 09
Lat -25 – -5 Lon 15 – 35



TRACE-A W-Africa Coast 1992 09
Lat -25 – -5 Lon 0 – 10

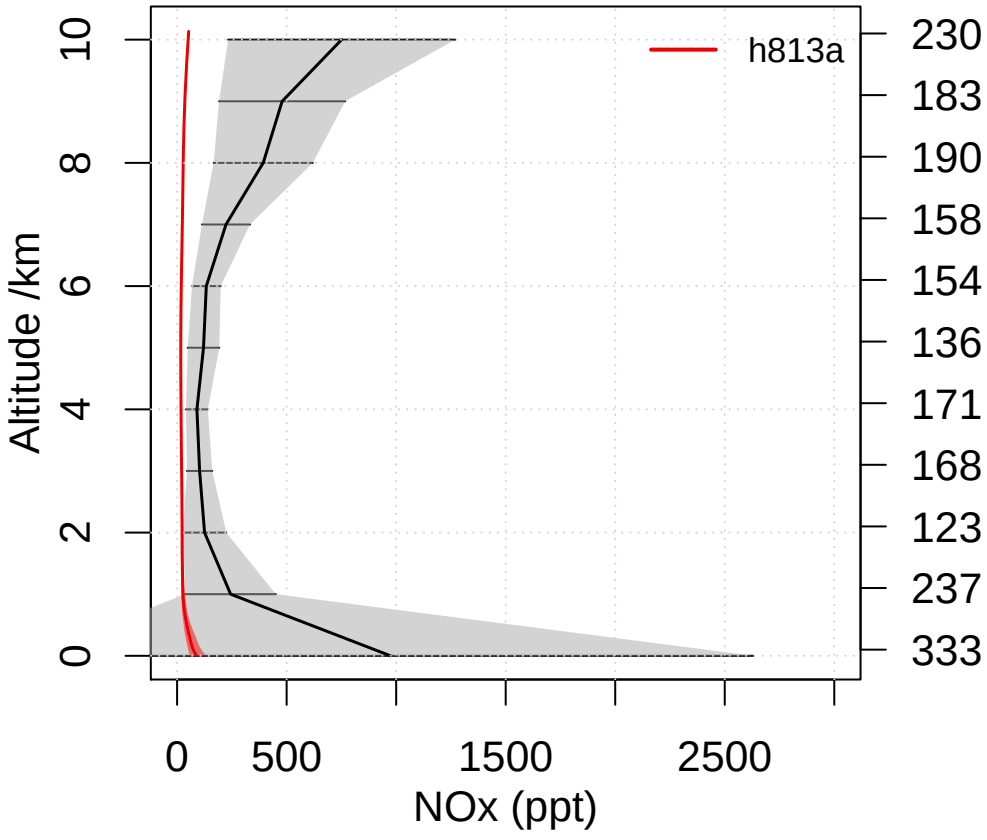


Emmons HNO3 comparison

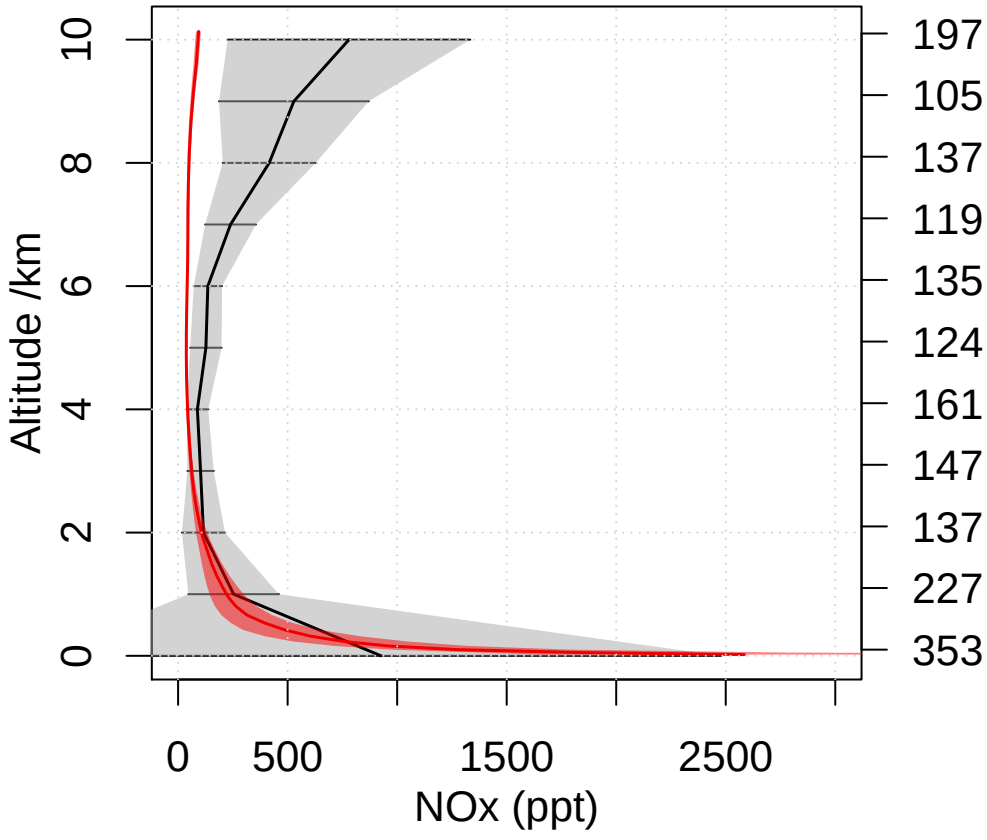


Emmons NOx comparison

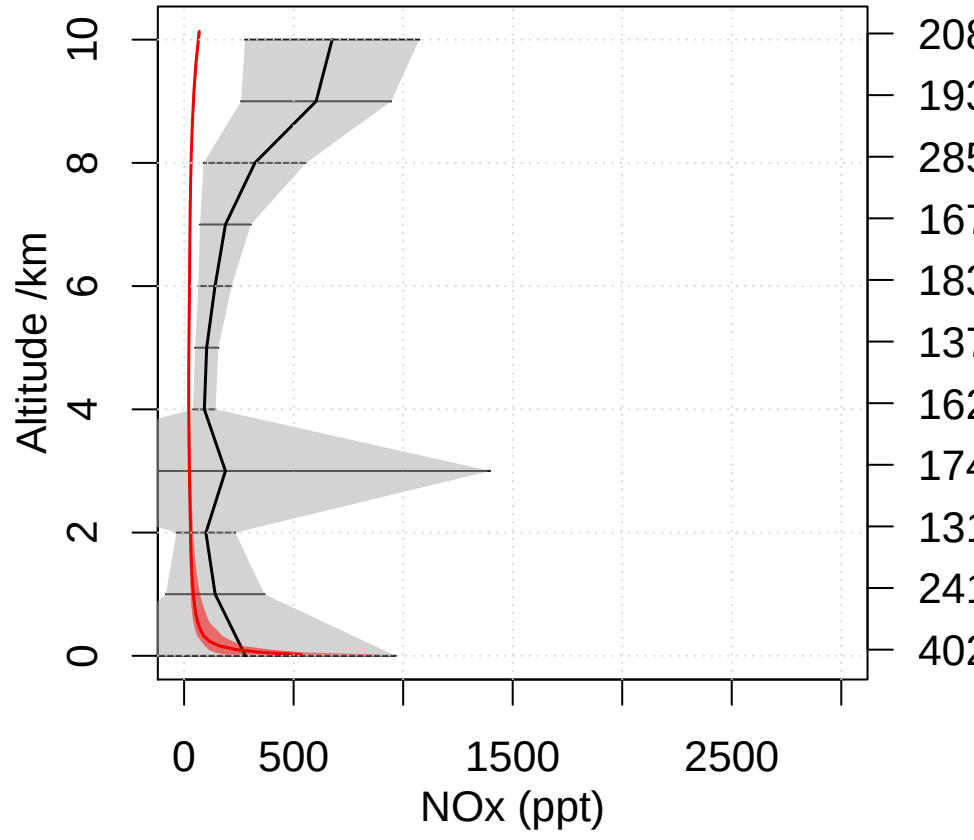
INTEX-NA East Coast 2004 07
Lat 32.5 – 40 Lon 296.5 – 307



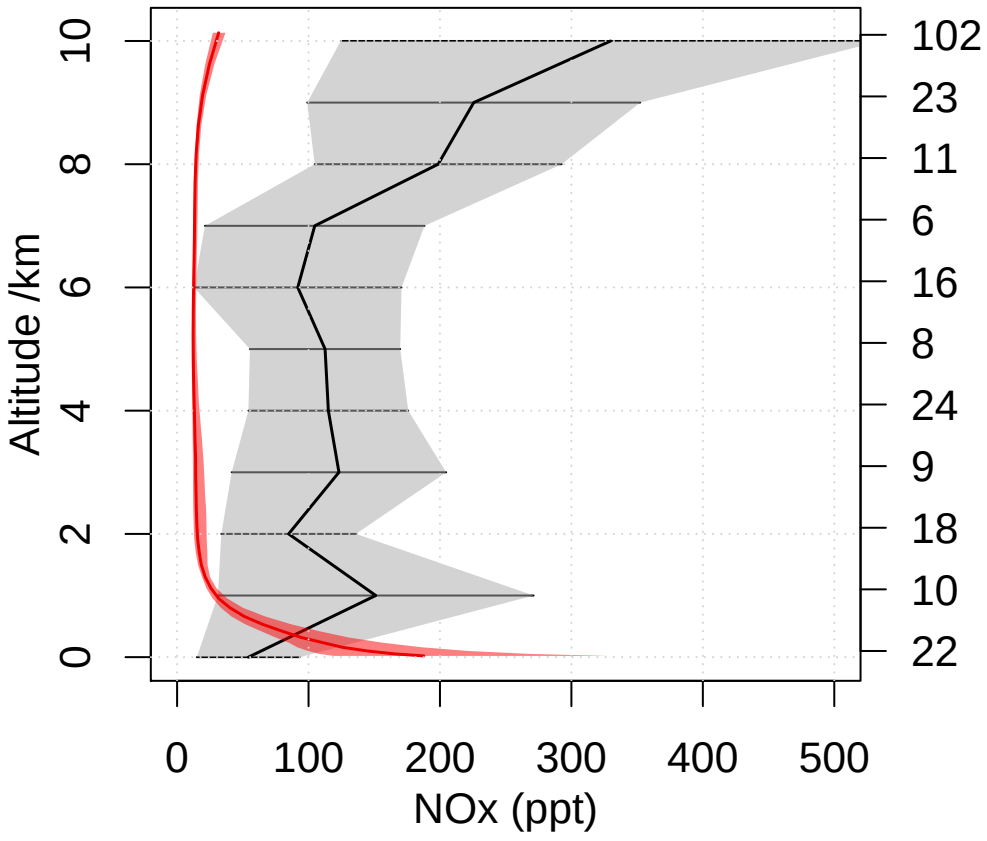
INTEX-NA Central 2004 07
Lat 30 – 40 Lon 259.5 – 285



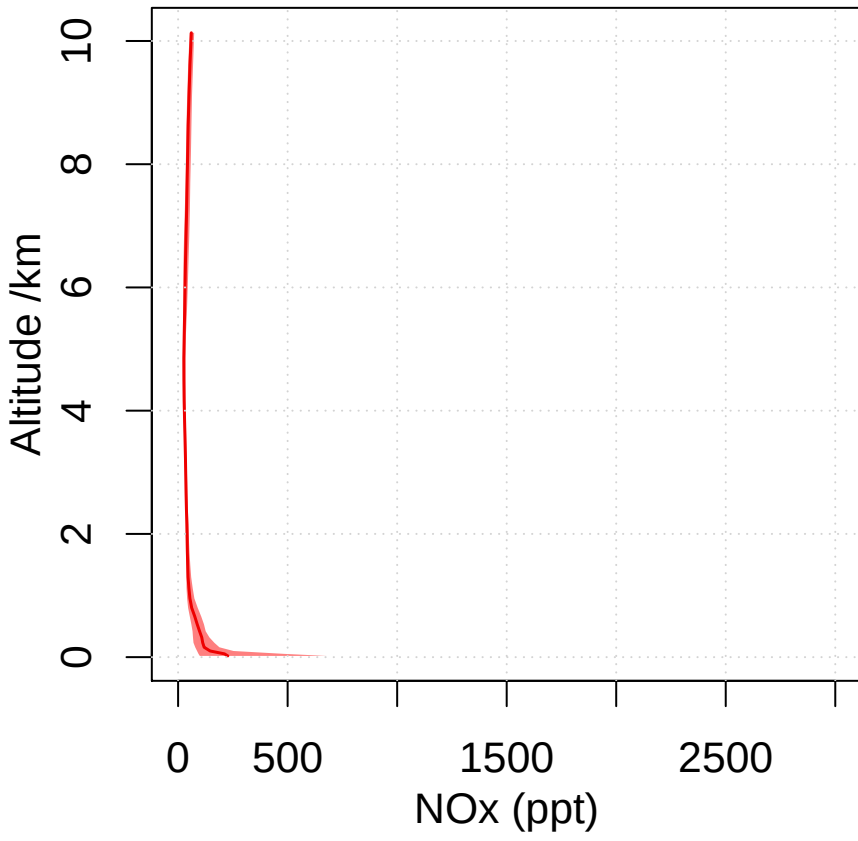
INTEX-NA North East 2004 07
Lat 42.5 – 52.5 Lon 285 – 310



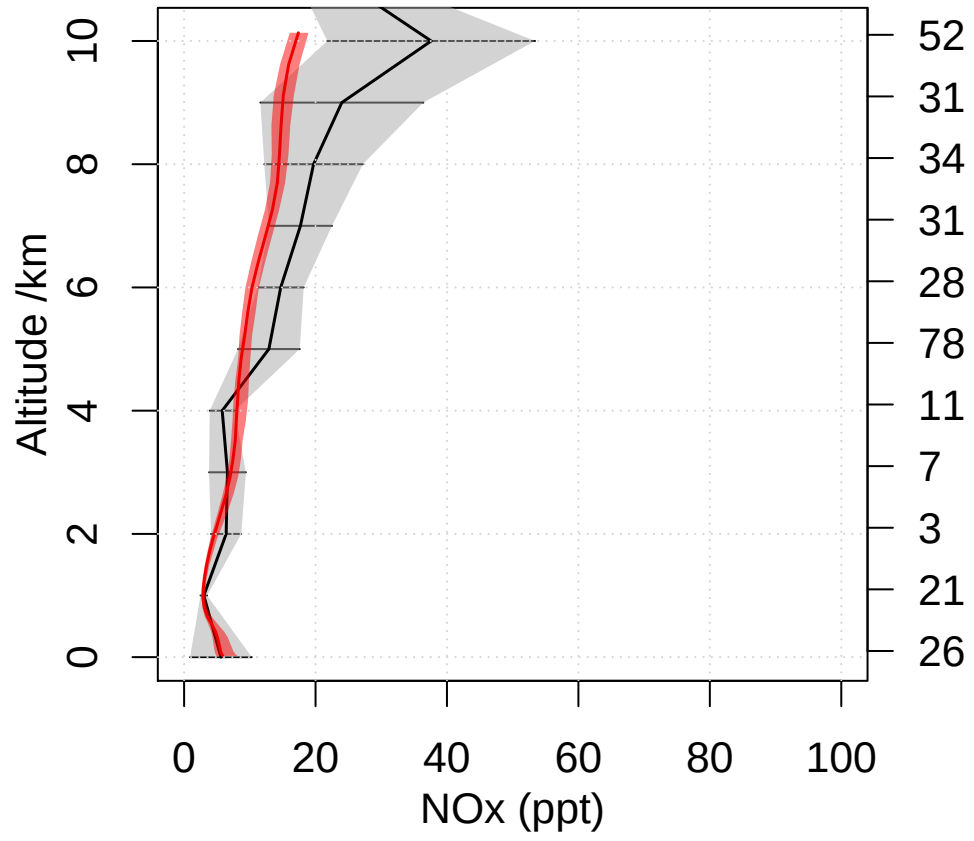
INTEX-NA West Coast 2004 07
Lat 32.5 – 45 Lon 217 – 240



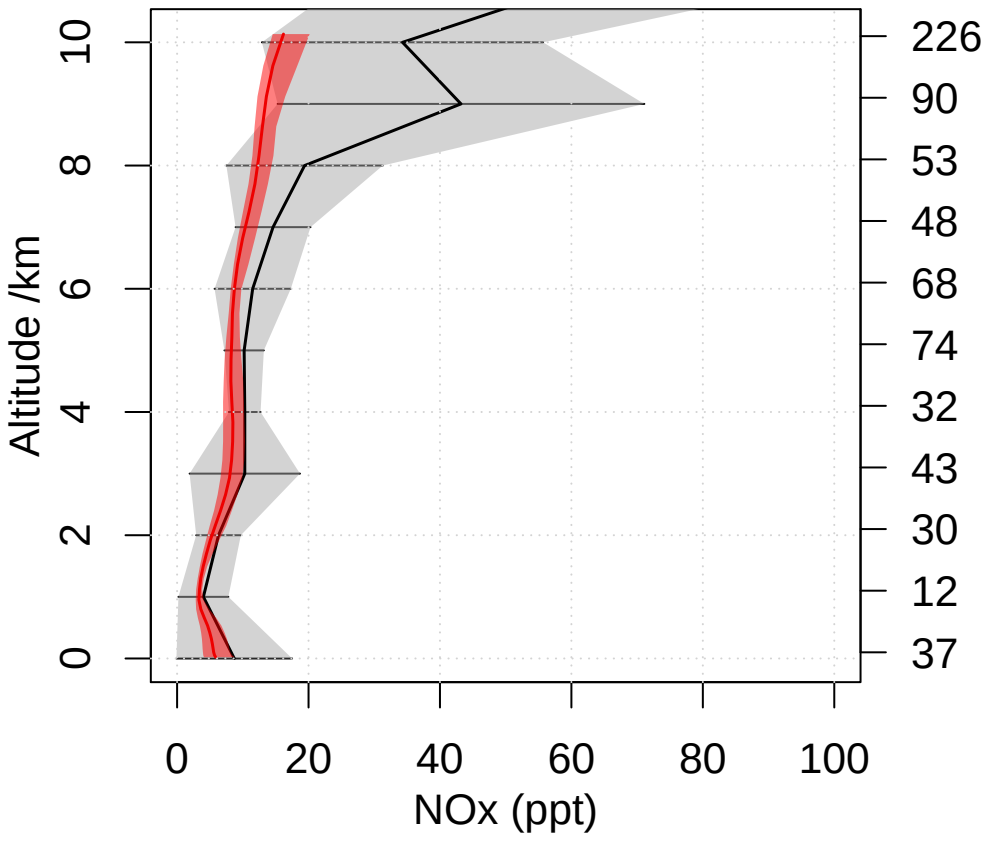
OP3 2008 07
Lat 2.5 – 7.5 Lon 112.5 – 120



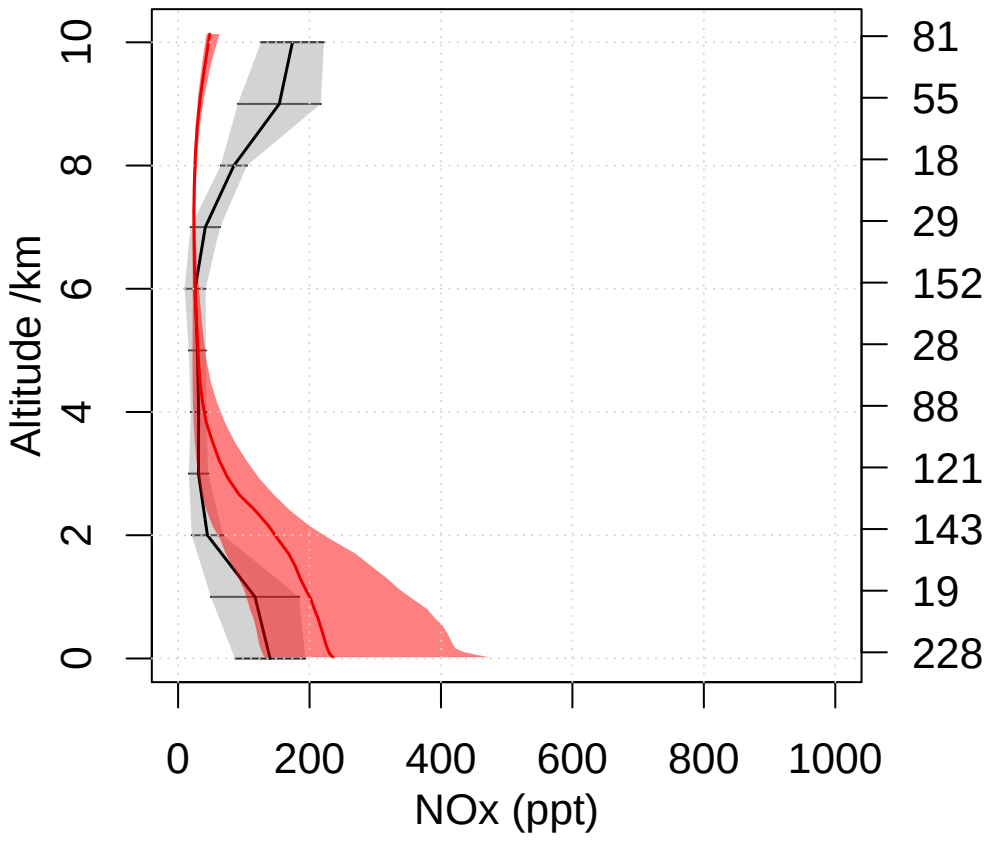
PEM-Tropics-B Christmas-Island 1999 01
Lat 0 – 10 Lon 200 – 220



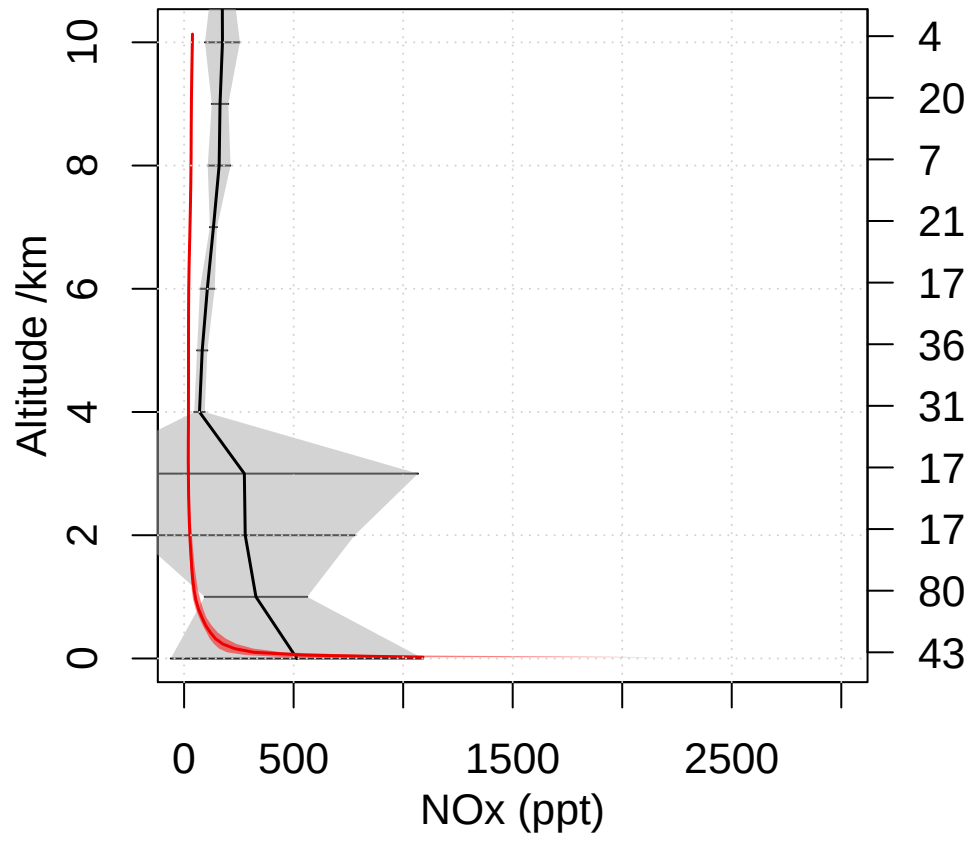
PEM-Tropics-B Tahiti 1999 03
Lat -20 – 0 Lon 200 – 230



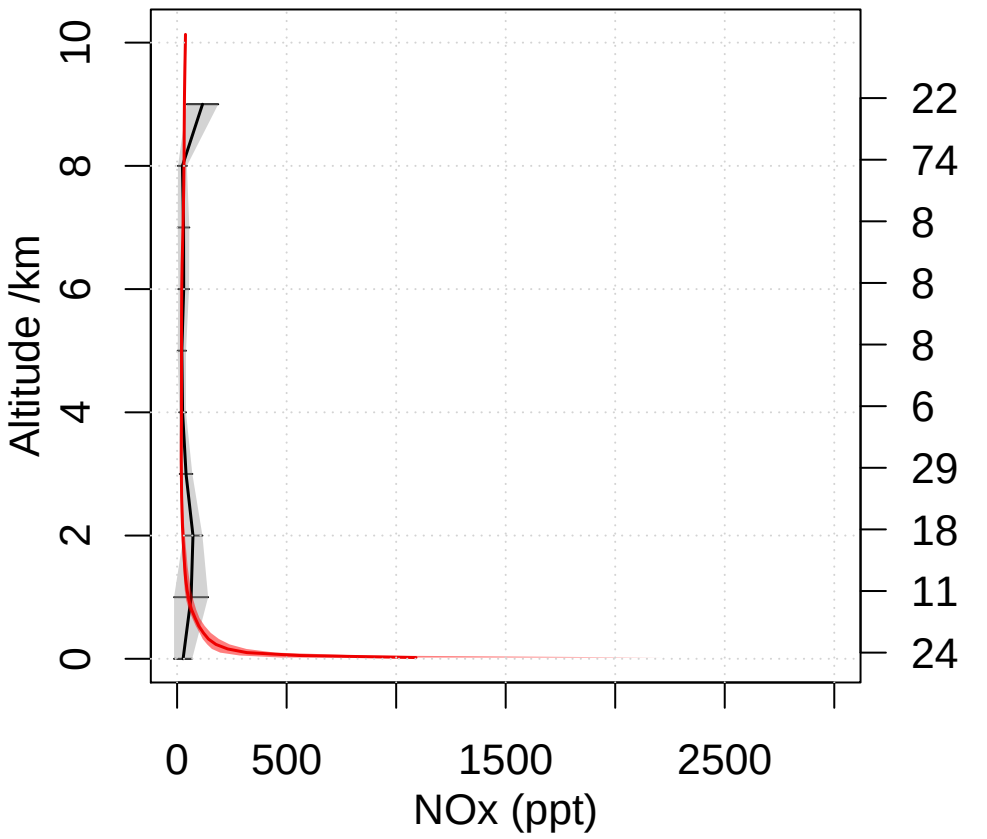
PEM-West-B Japan 1994 02
Lat 25 – 40 Lon 135 – 150



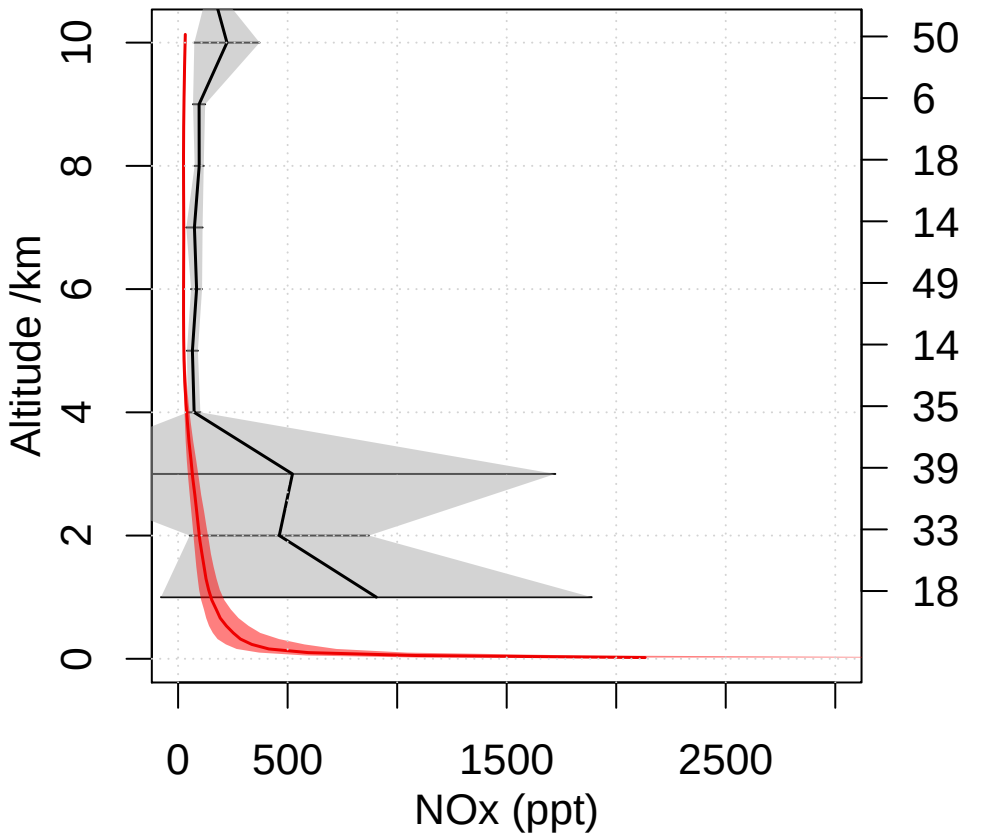
TRACE-A E-Brazil 1992 09
Lat -15 – -5 Lon 310 – 320



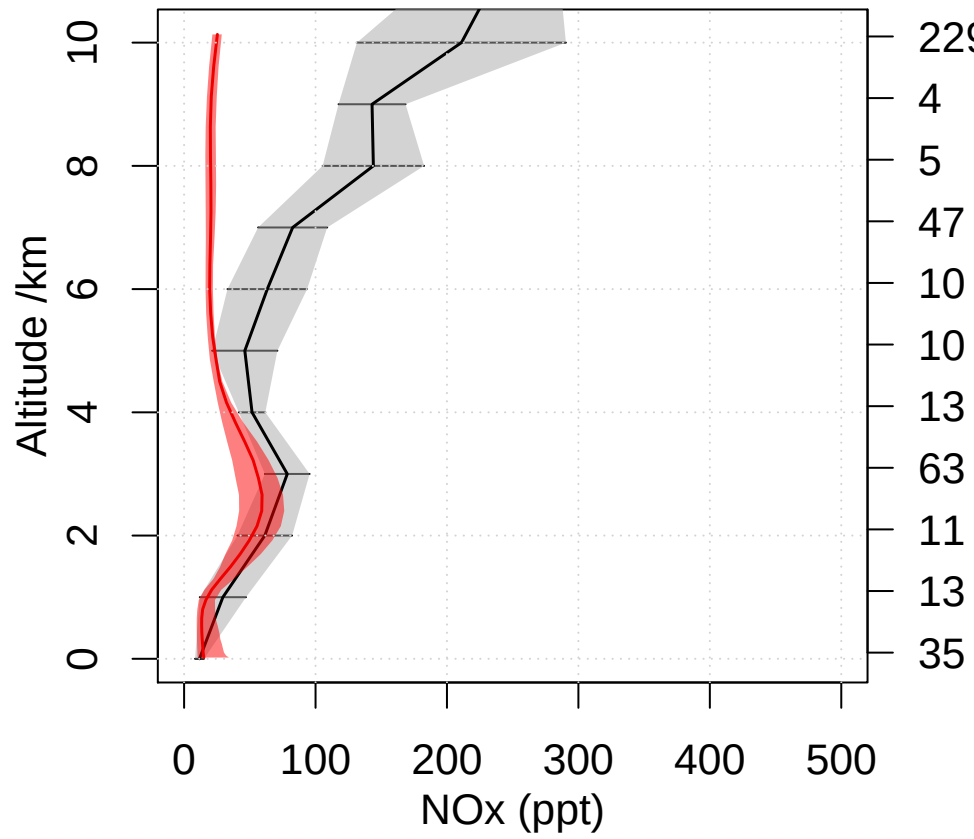
TRACE-A E-Brazil Coast 1992 09
Lat -35 – -25 Lon 310 – 320



TRACE-A S-Africa 1992 09
Lat -25 – -5 Lon 15 – 35



TRACE-A W-Africa Coast 1992 09
Lat -25 – -5 Lon 0 – 10



UKCA h813a

[OH] Air mass weighted (10⁶ molecules cm⁻³)

Mean OH= 1.08e+06 molec/cm3

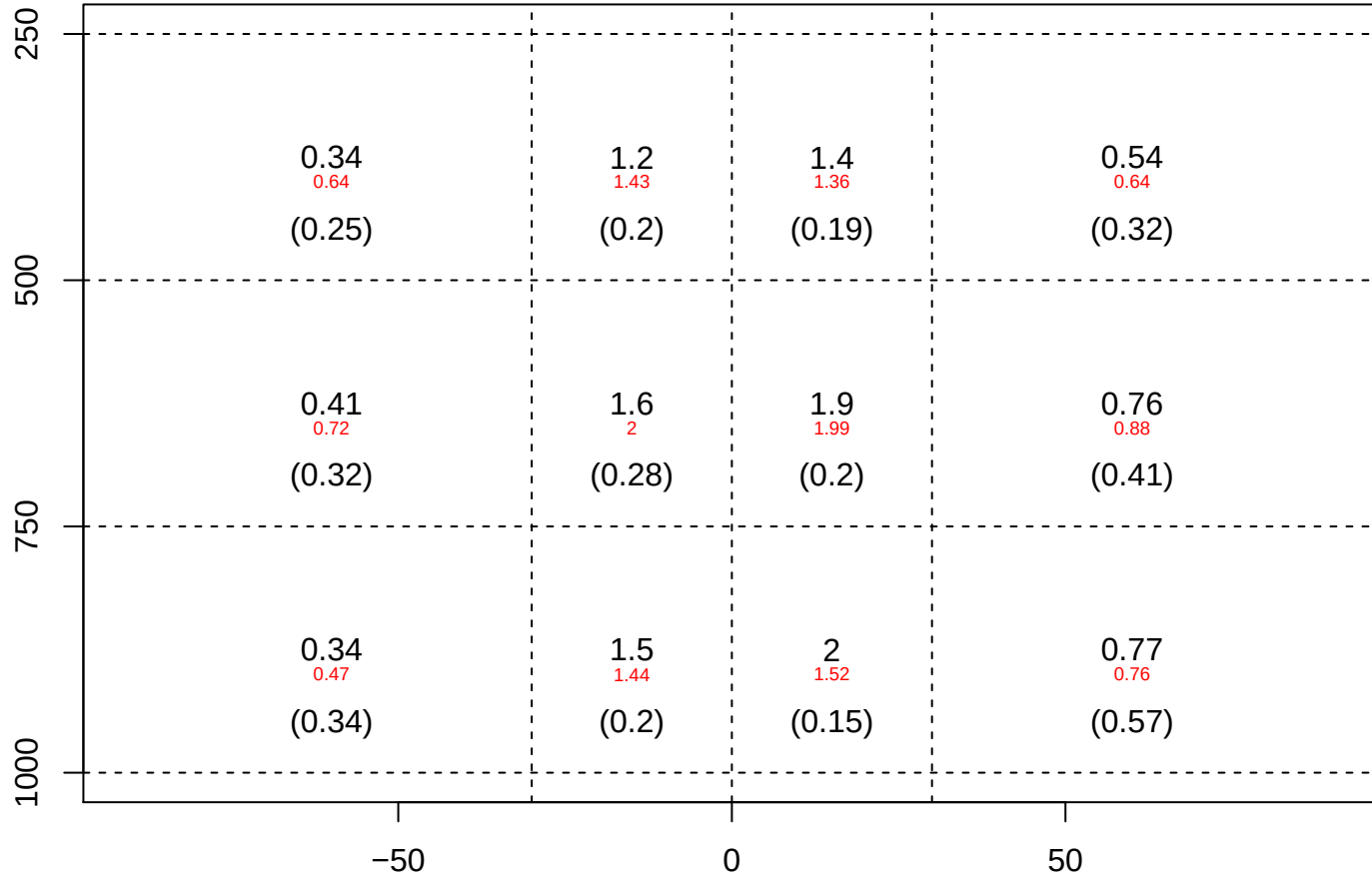
ACCMIP Multi-model Mean= 1.17 (+/- 0.1) e+06 molec/cm3

NH:SH ratio= 1.45 Patra et al 2014: 0.97 +/- 0.12

Red: Spivakovsky values

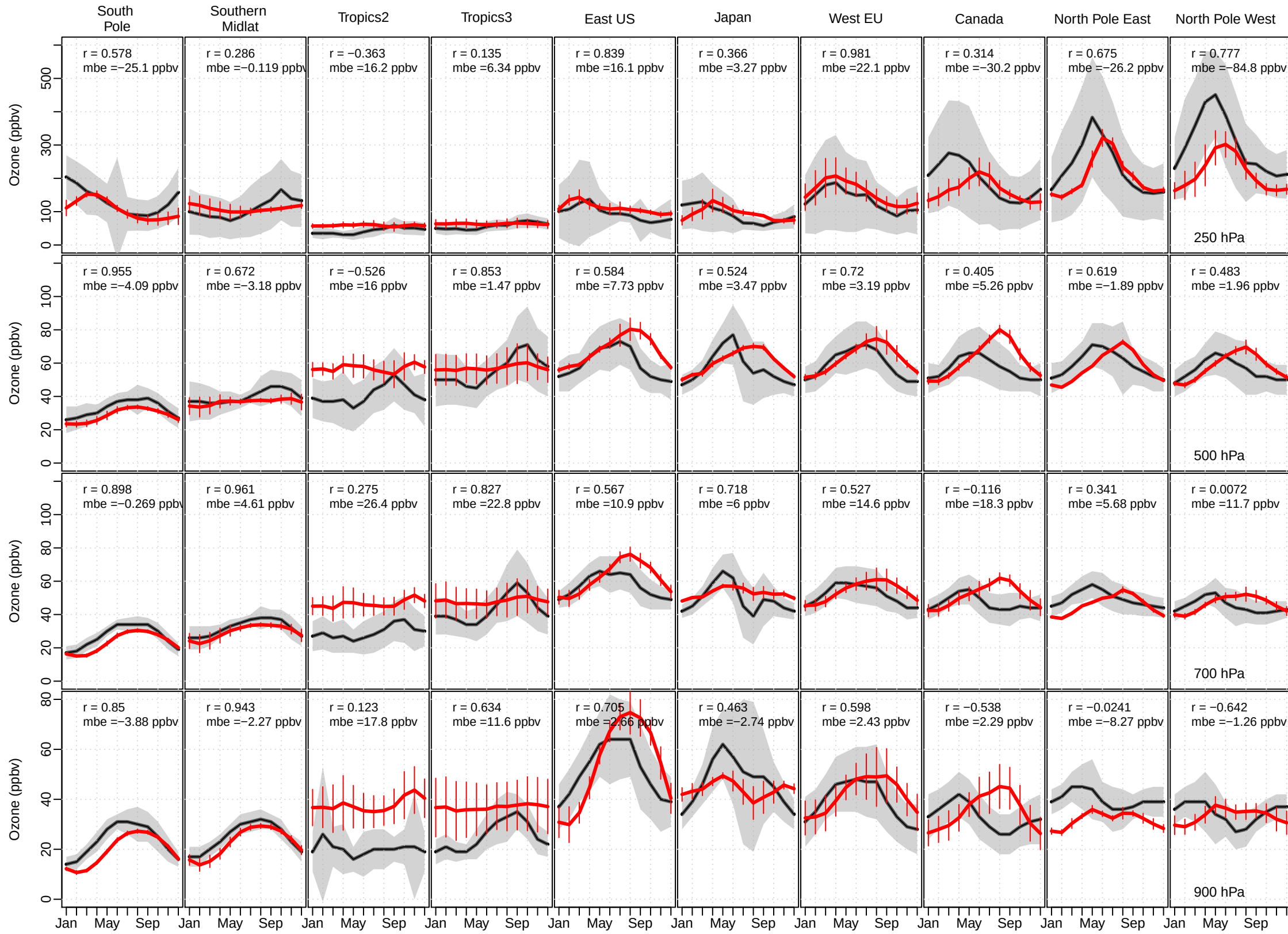
Values in (): Std dev

Pressure (hPa)



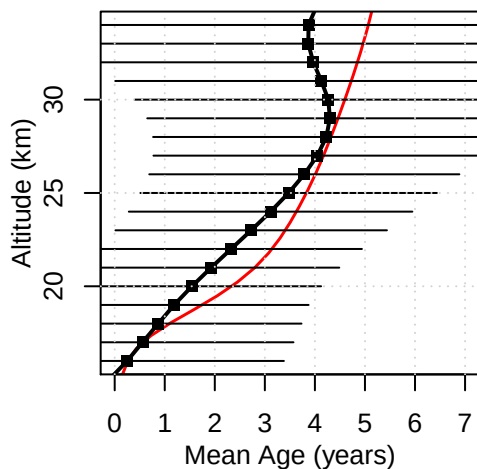
Latitude

h813a Tilmes ozone sonde comparison

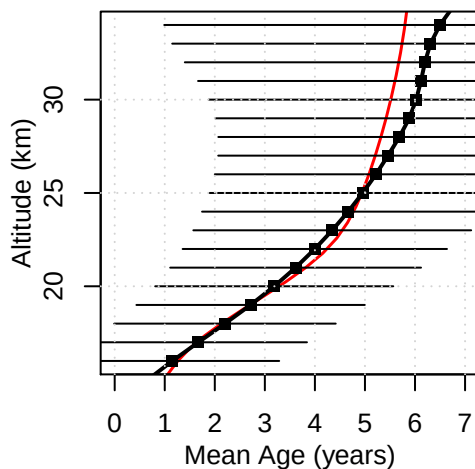


UKCA h813a Mean Age of Air

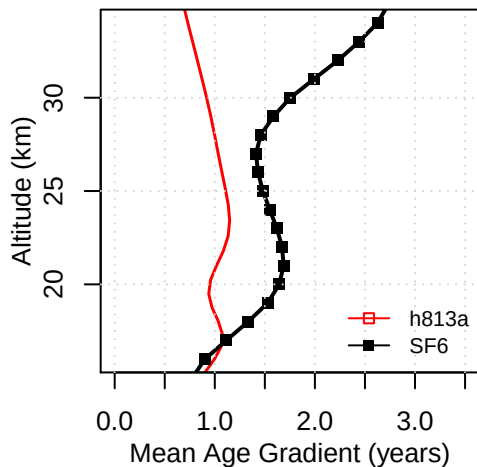
Tropical Mean Age Profile



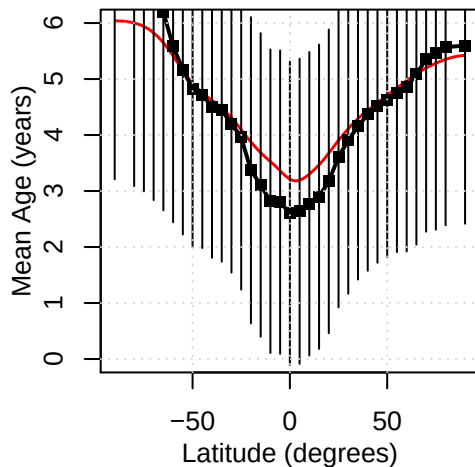
Midlatitude Mean Age Profile



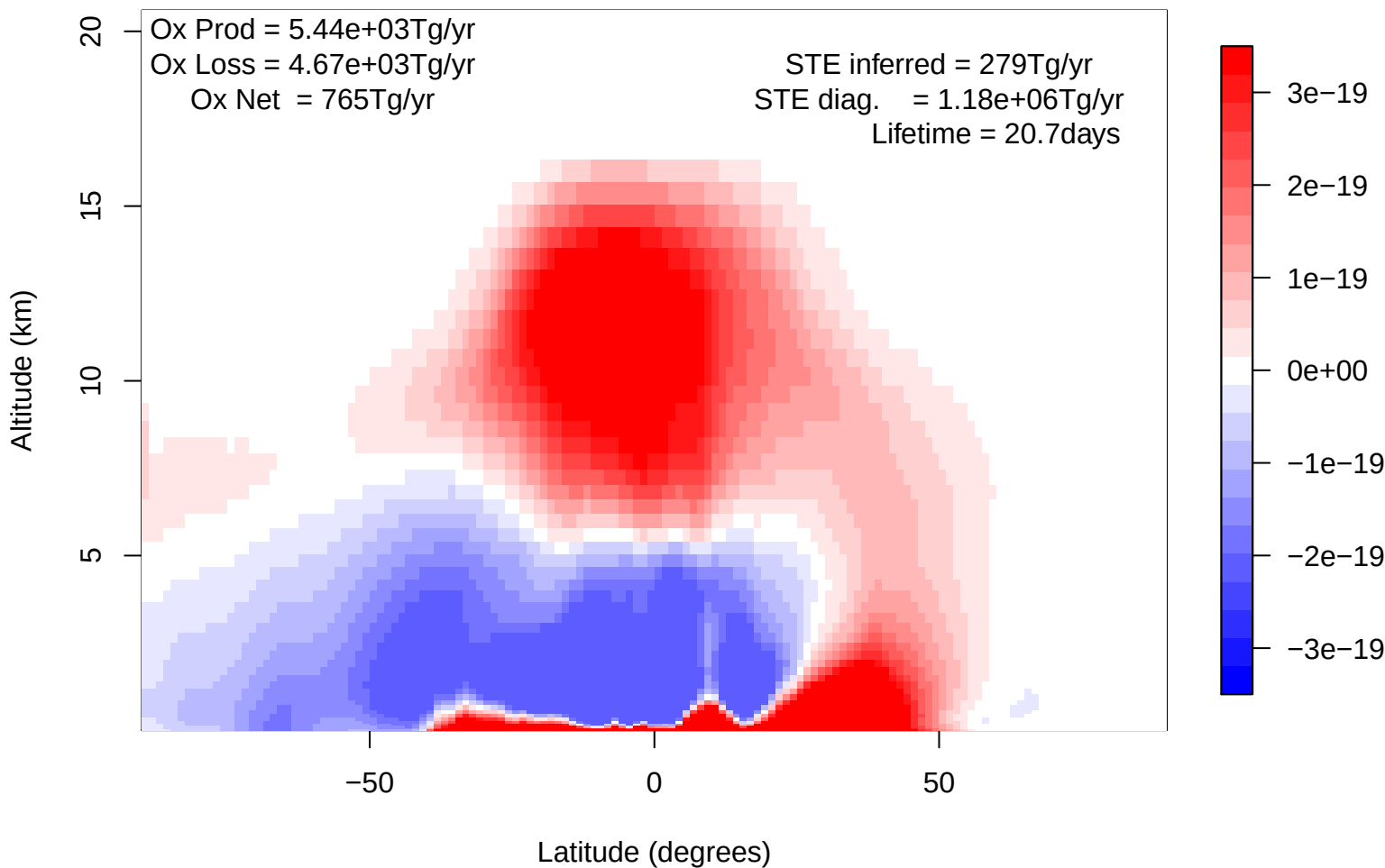
Trop-Midlat Mean Age Gradient Prof



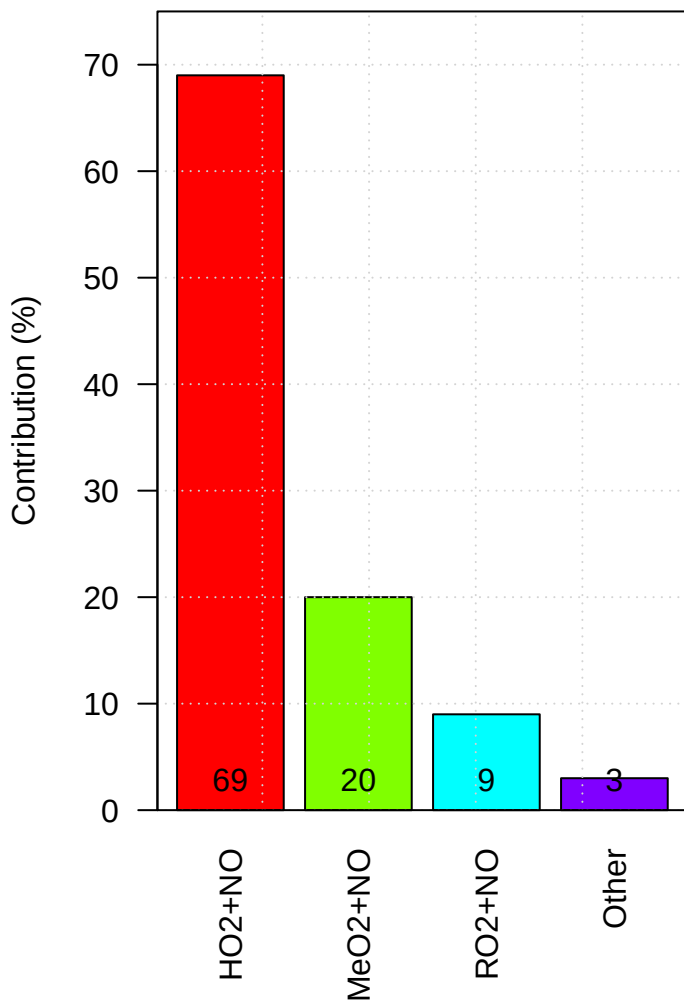
Mean Age, 23km (~50hPa)



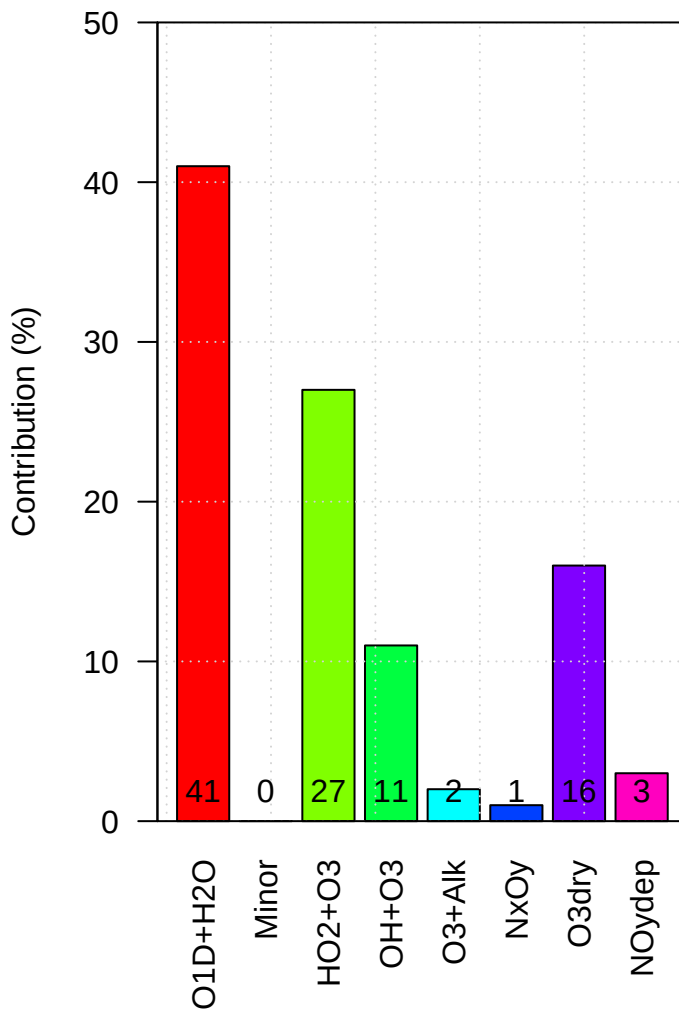
UKCA h813a Ox Net Chemical Production



h813a Production of Tropospheric Ox

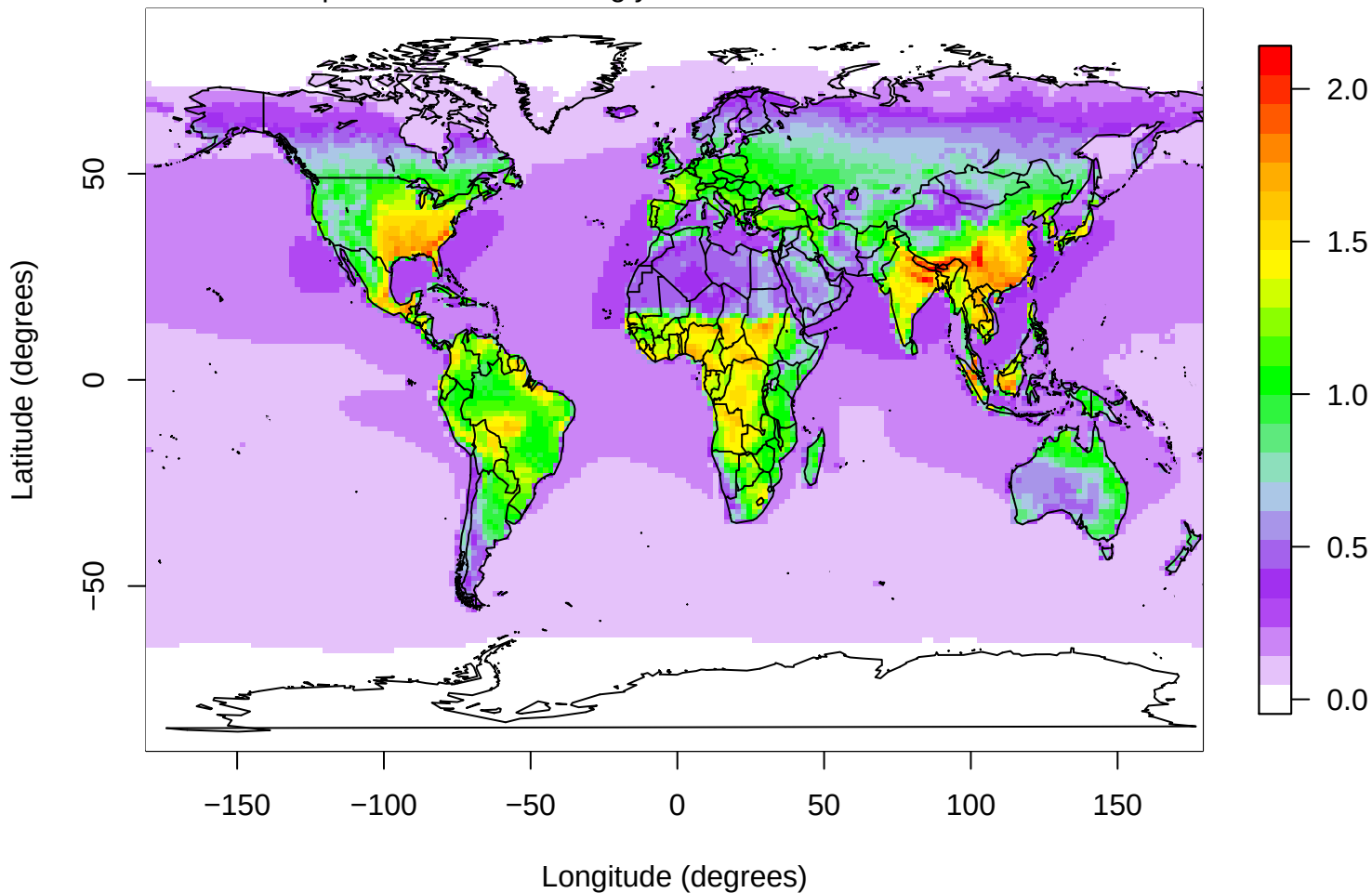


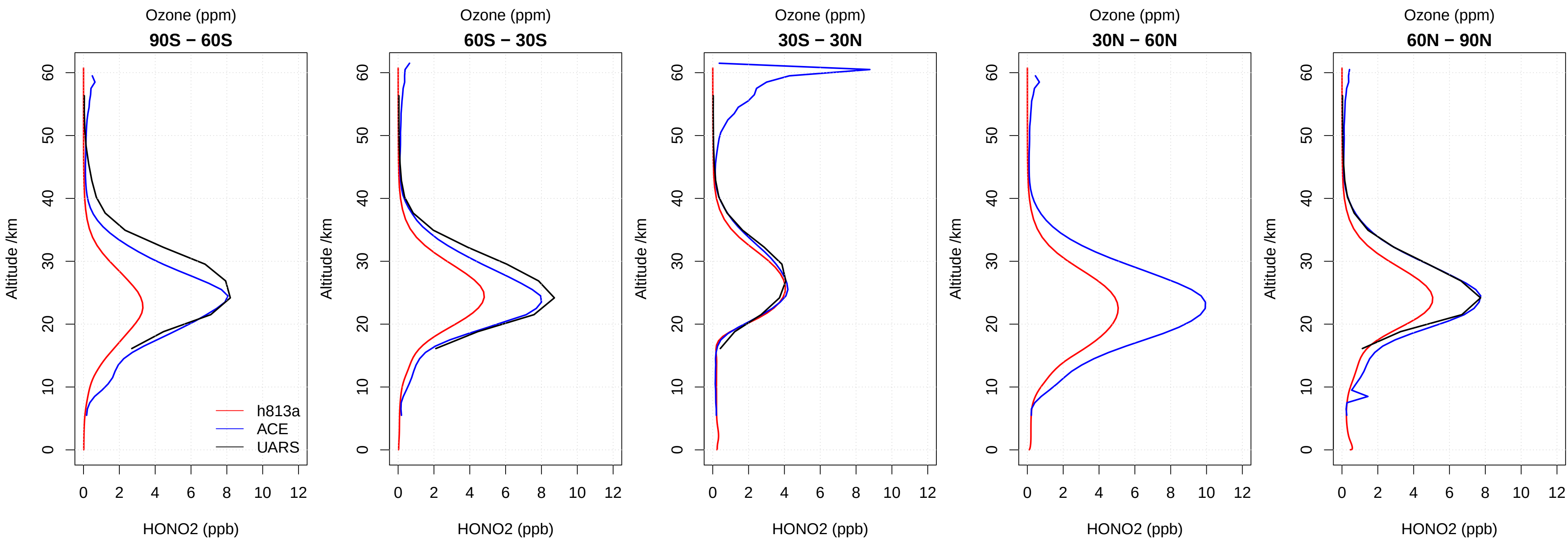
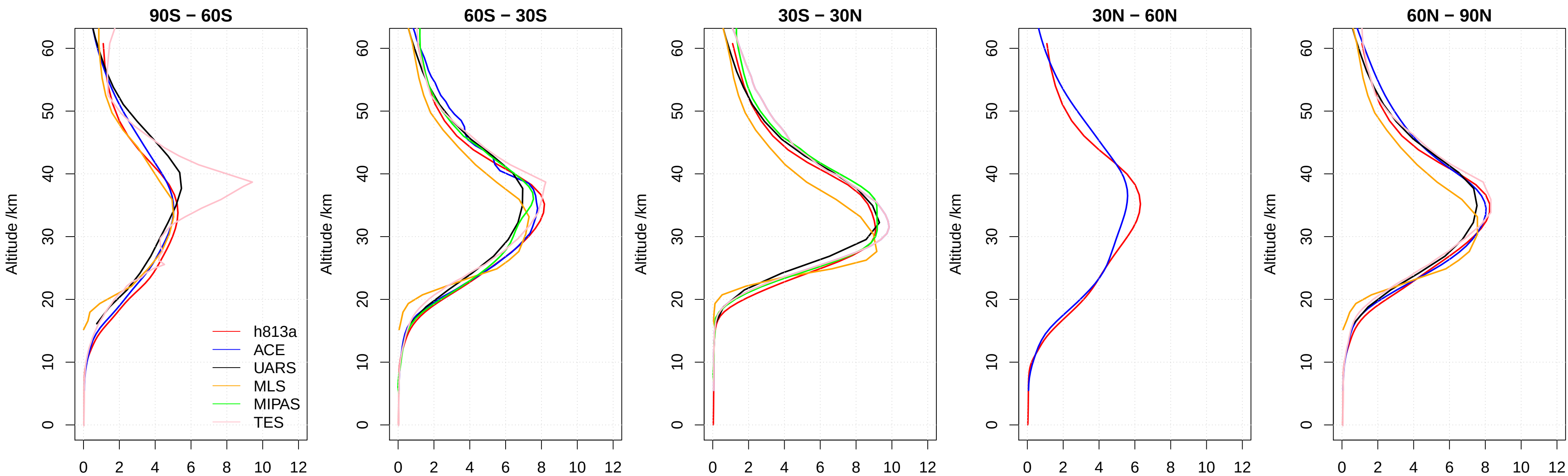
h813a Loss of Tropospheric Ox

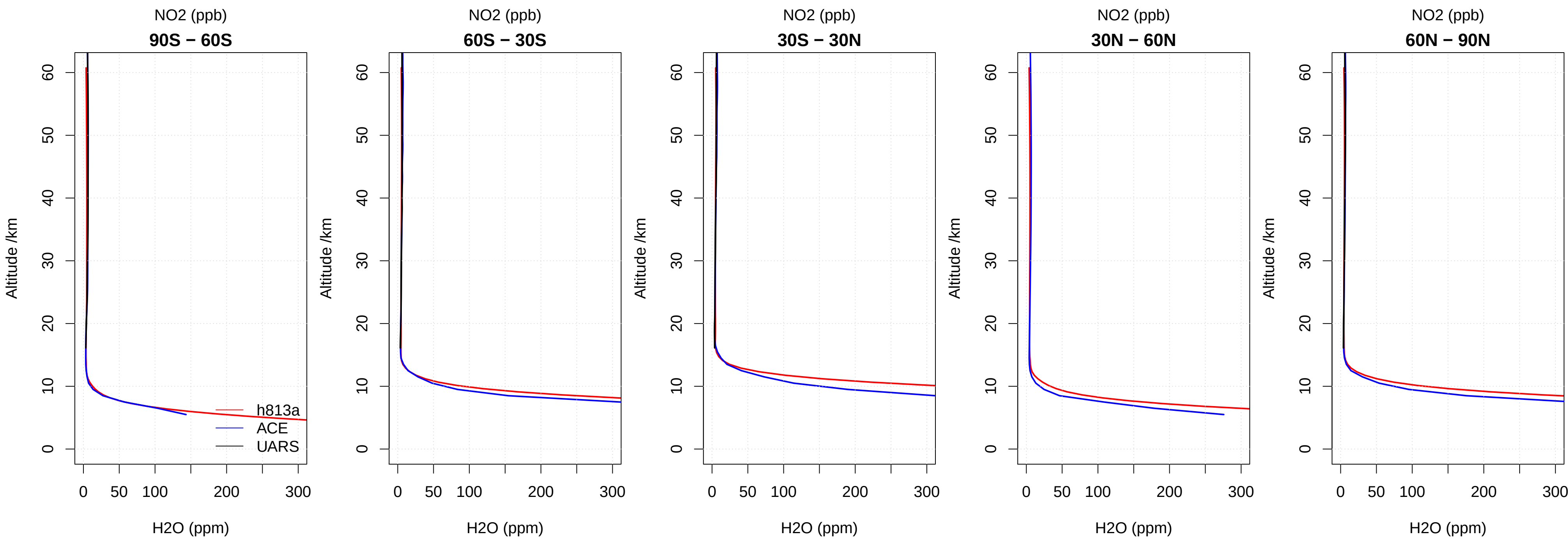
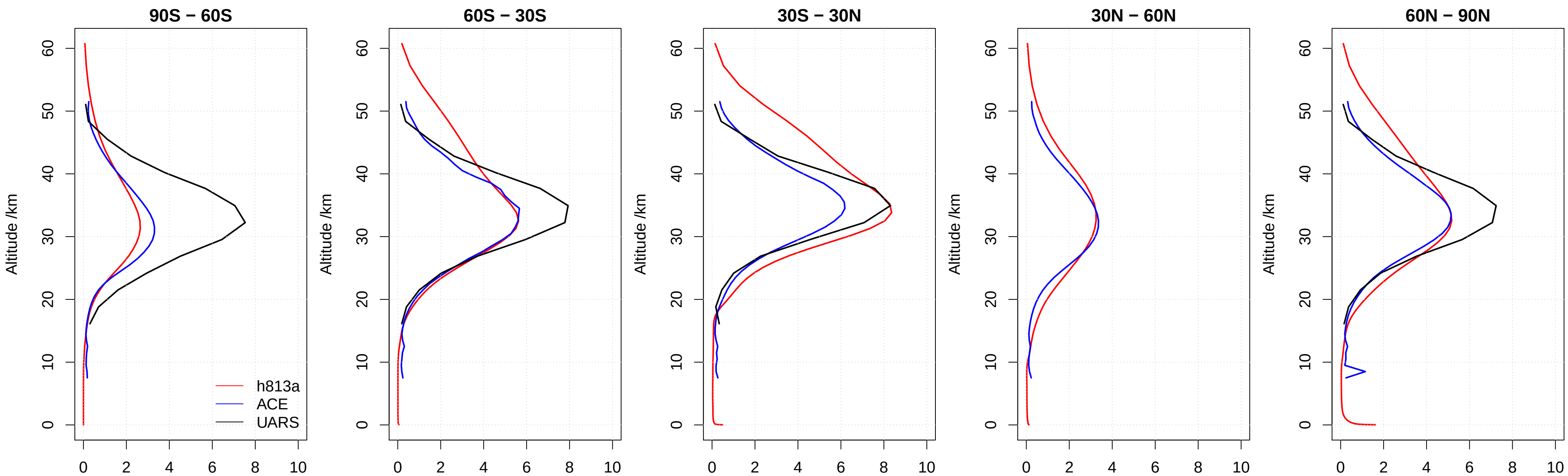


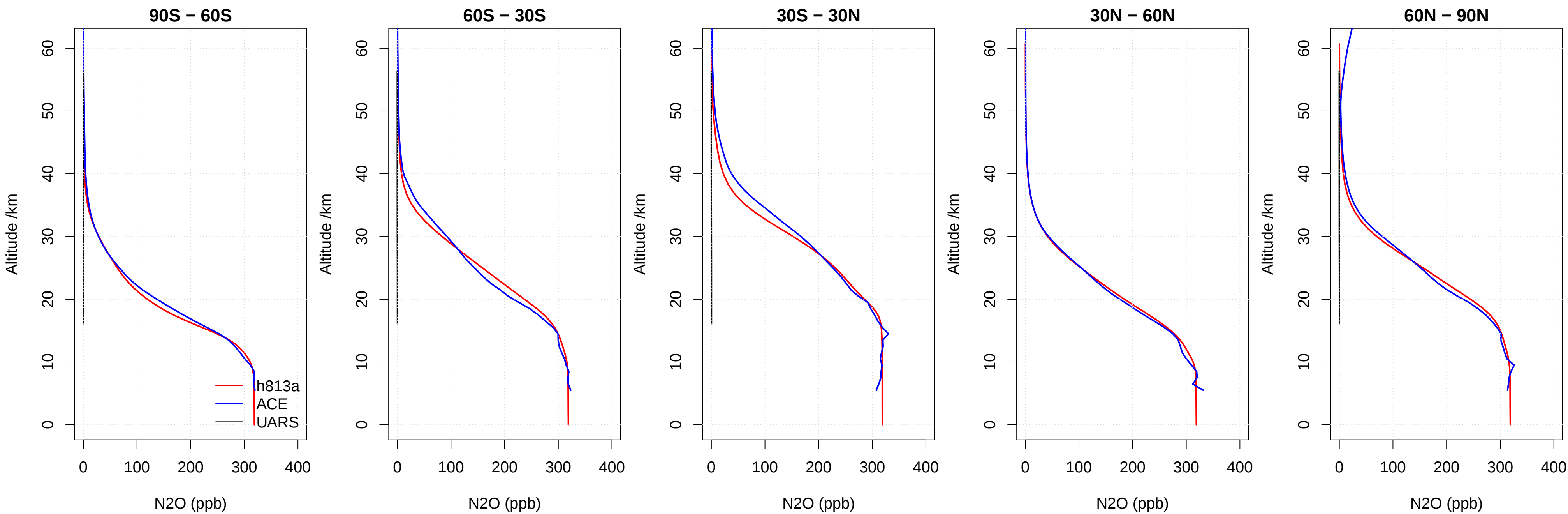
UKCA Ox deposition h813a

Total Ox Deposition = 1.04×10^3 Tg/yr









UKCA h813a

% CH₄ + OH flux (moles cm⁻³ s⁻¹)

