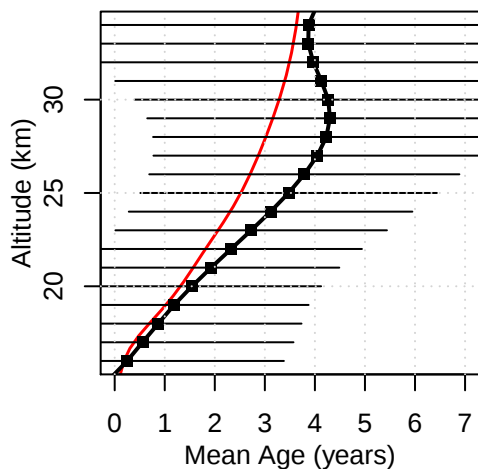
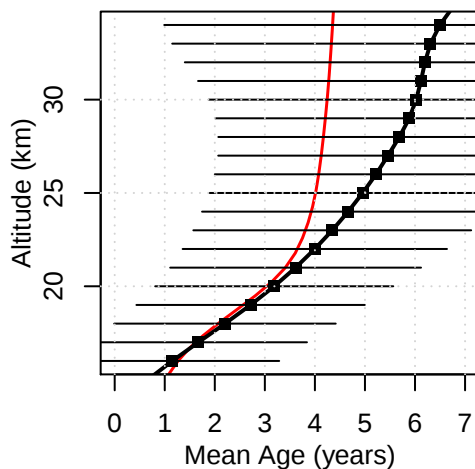


UKCA xkawa Mean Age of Air

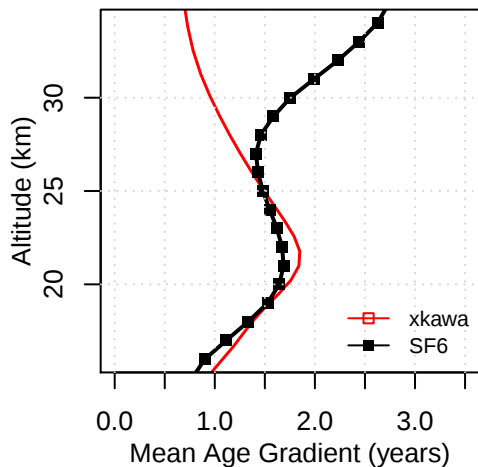
Tropical Mean Age Profile



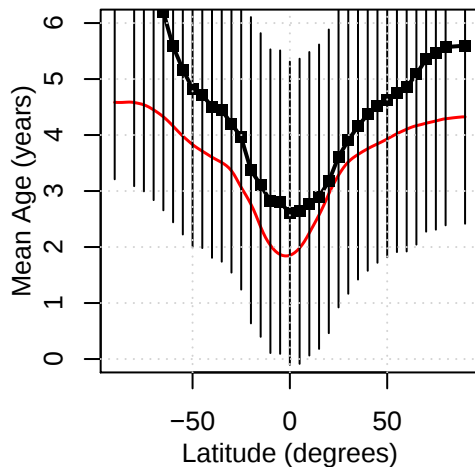
Midlatitude Mean Age Profile



Trop-Midlat Mean Age Gradient Prof

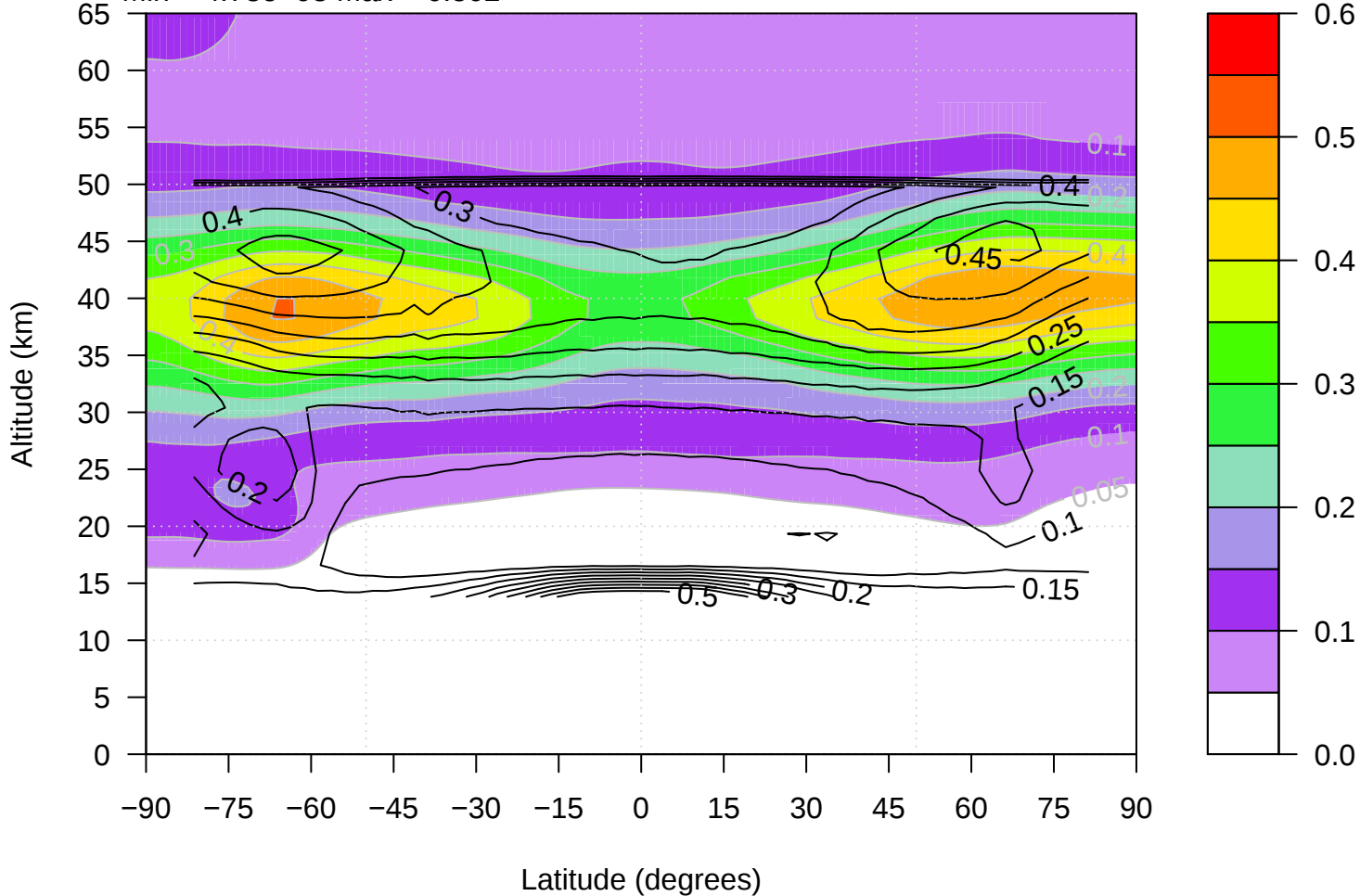


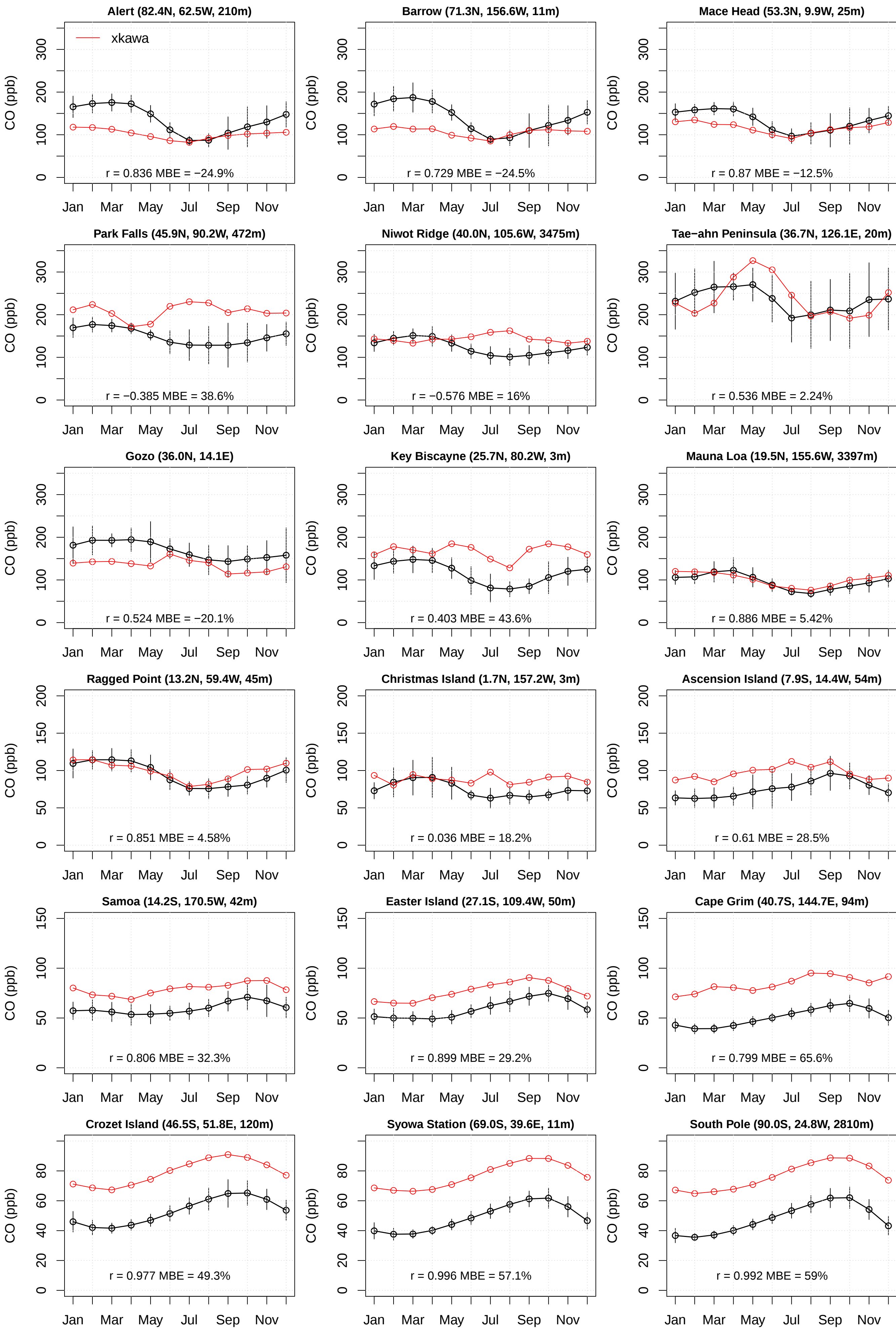
Mean Age, 23km (~50hPa)



ppm

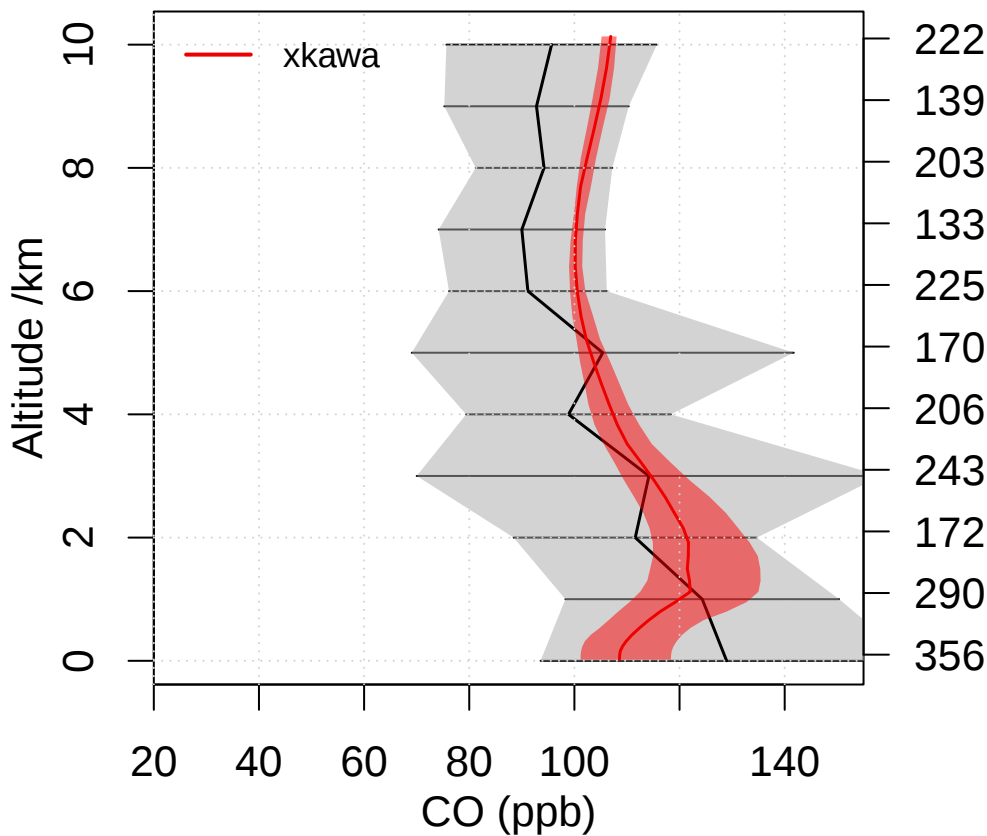
0.6



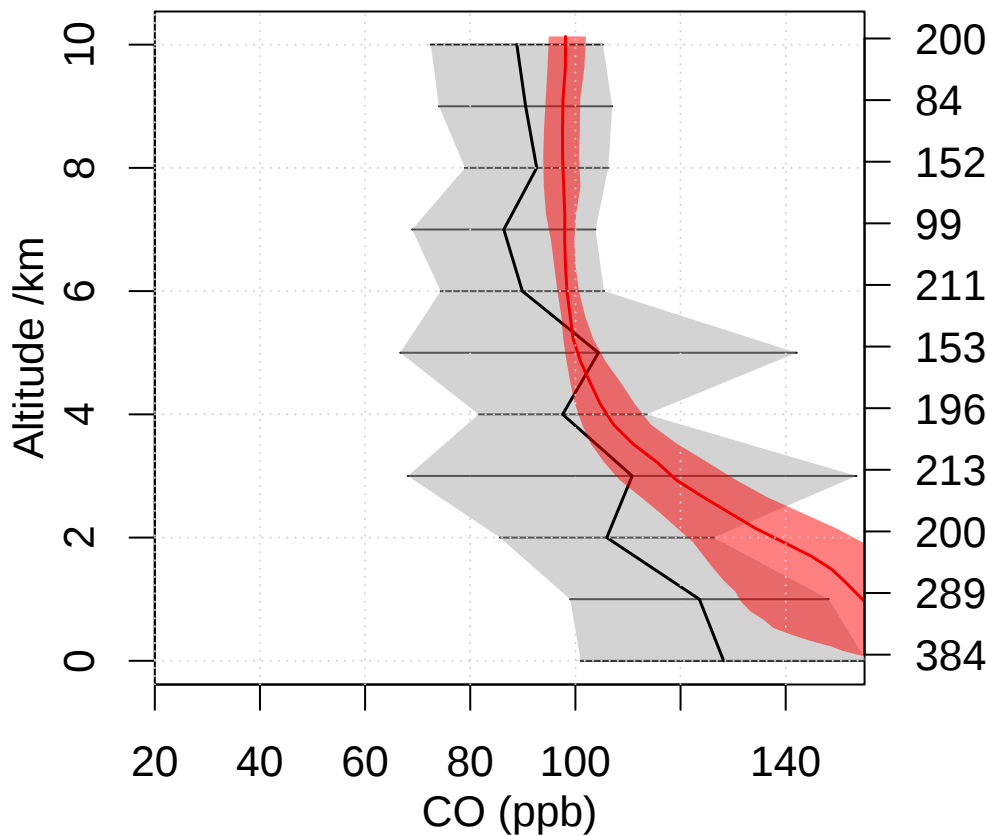


Emmons CO comparison

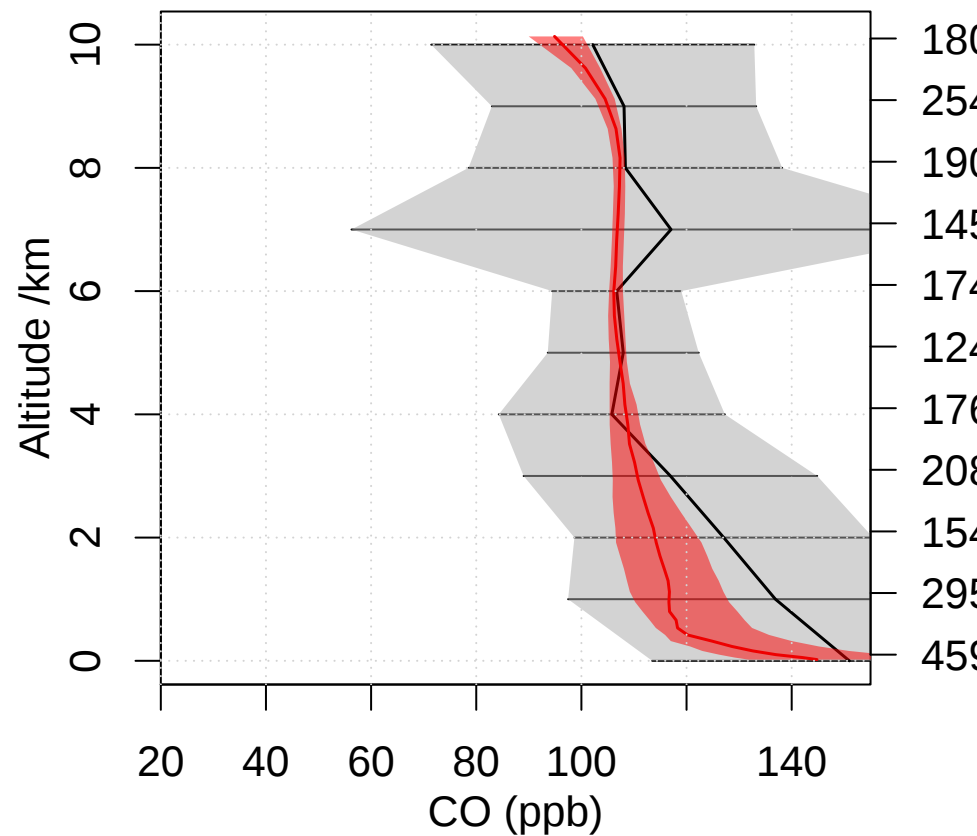
INTEX-NA East Coast 2004 07
Lat 32.5 – 40 Lon 296.5 – 307



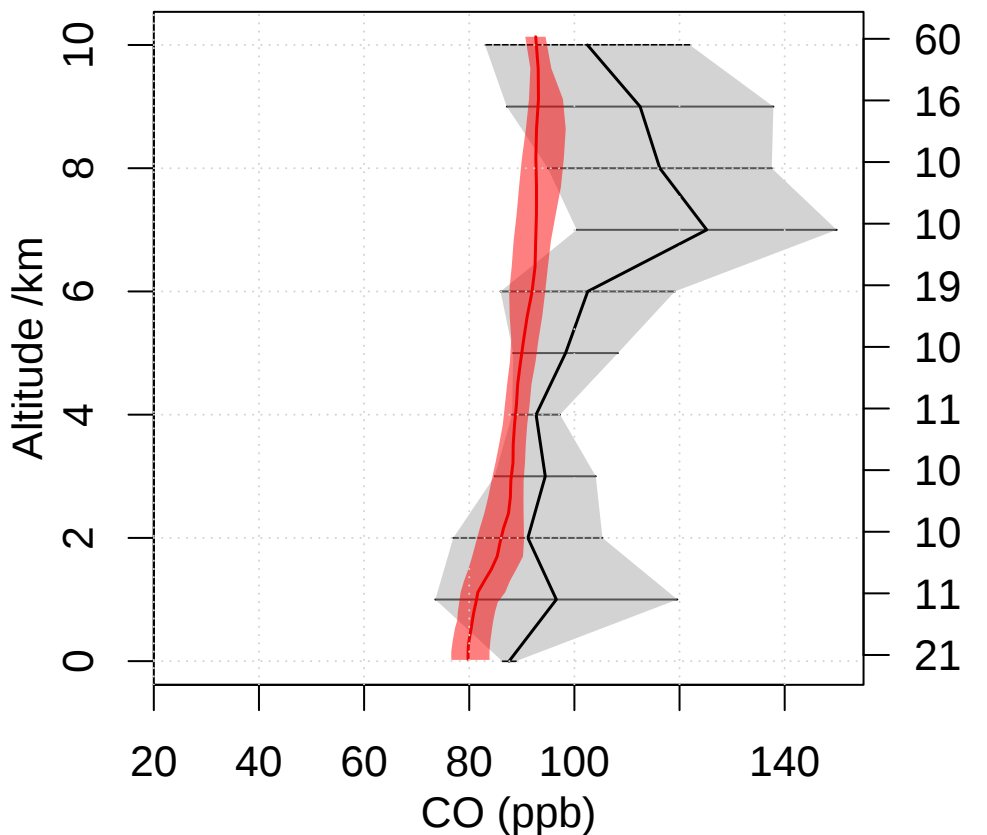
INTEX-NA Central 2004 07
Lat 30 – 40 Lon 259.5 – 285



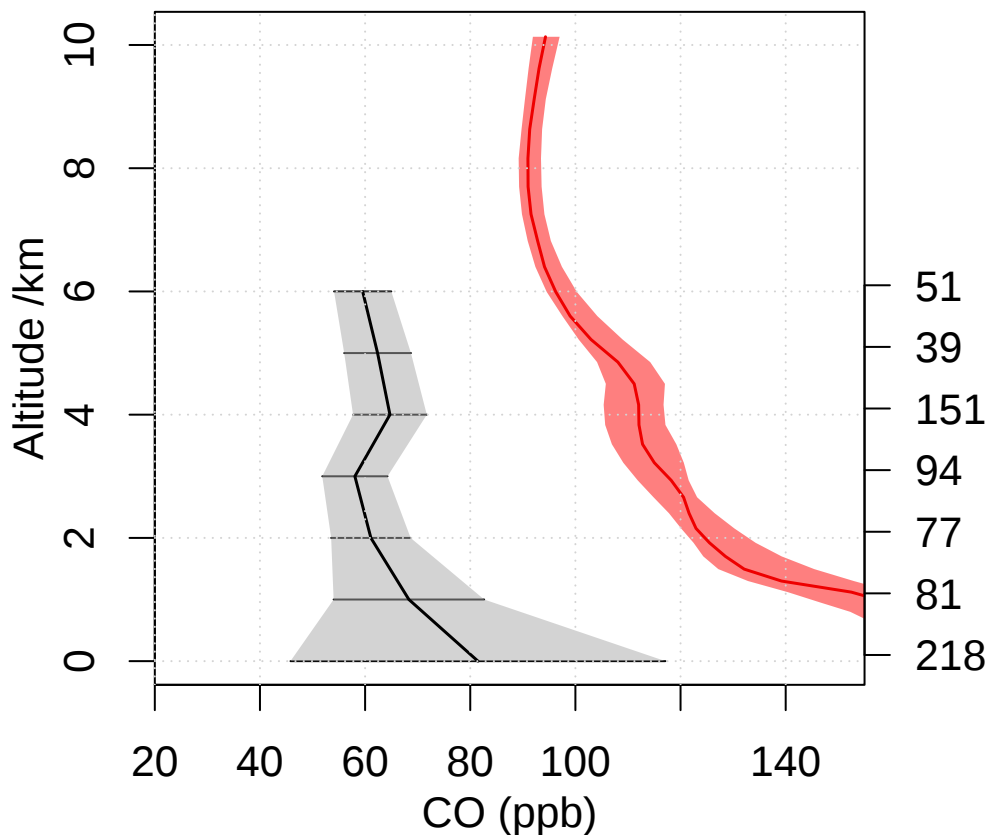
INTEX-NA North East 2004 07
Lat 42.5 – 52.5 Lon 285 – 310



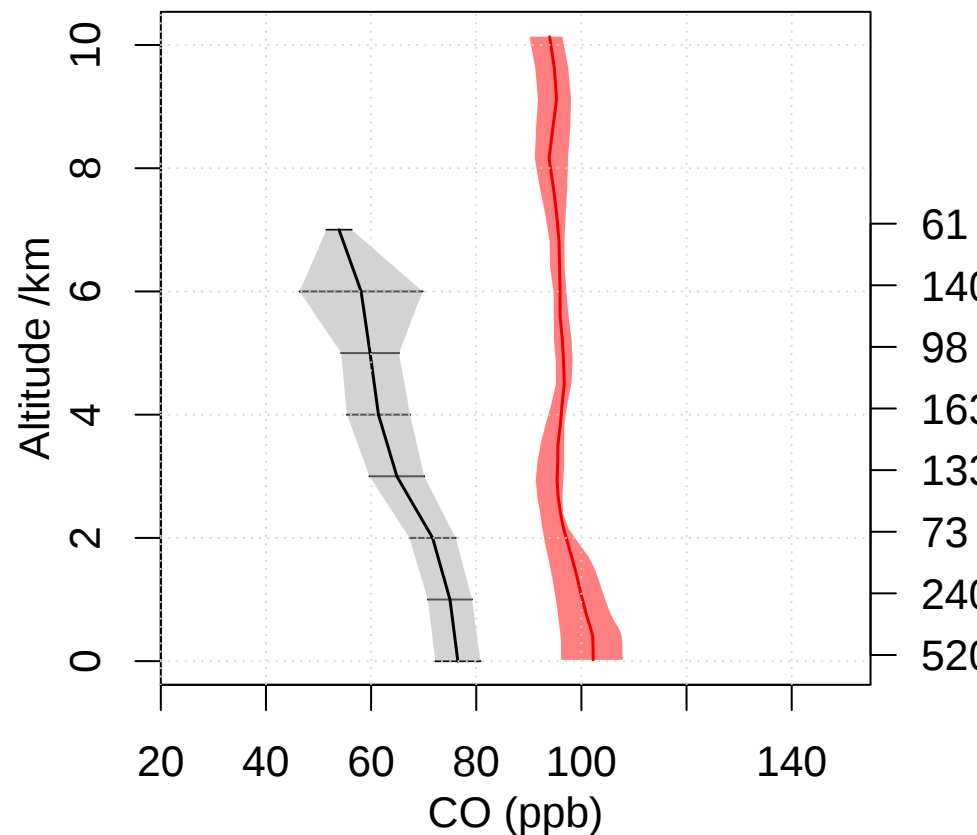
INTEX-NA West Coast 2004 07
Lat 32.5 – 45 Lon 217 – 240



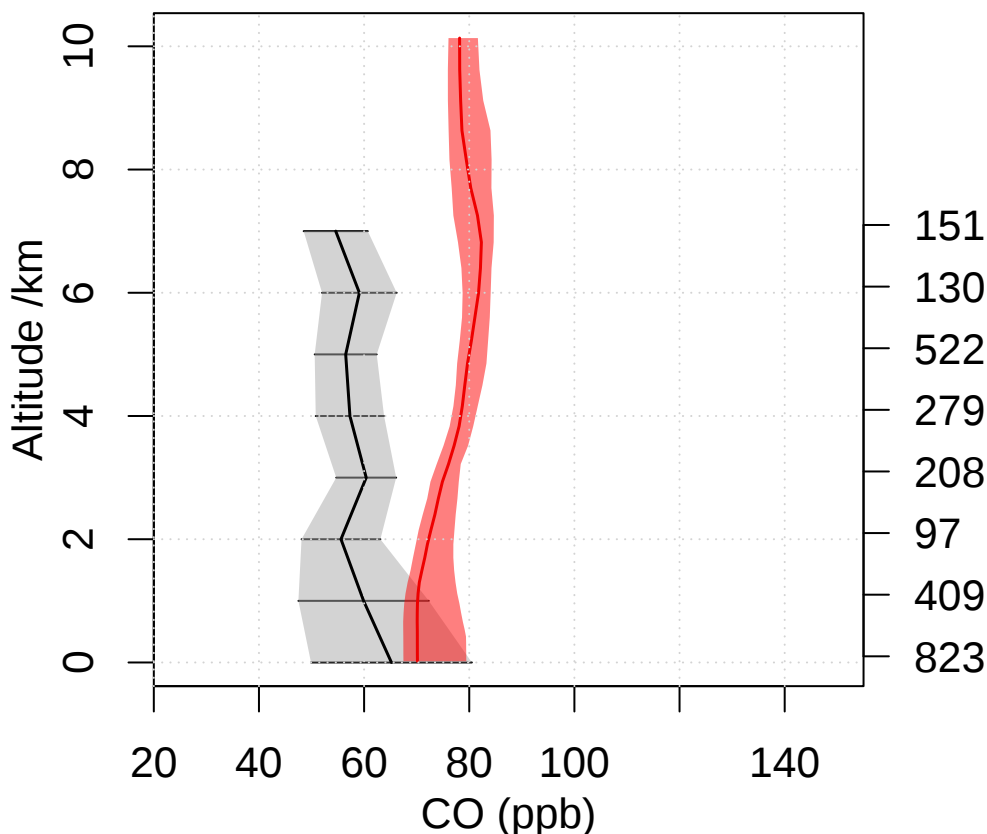
OP3 2008 07
Lat 2.5 – 7.5 Lon 112.5 – 120



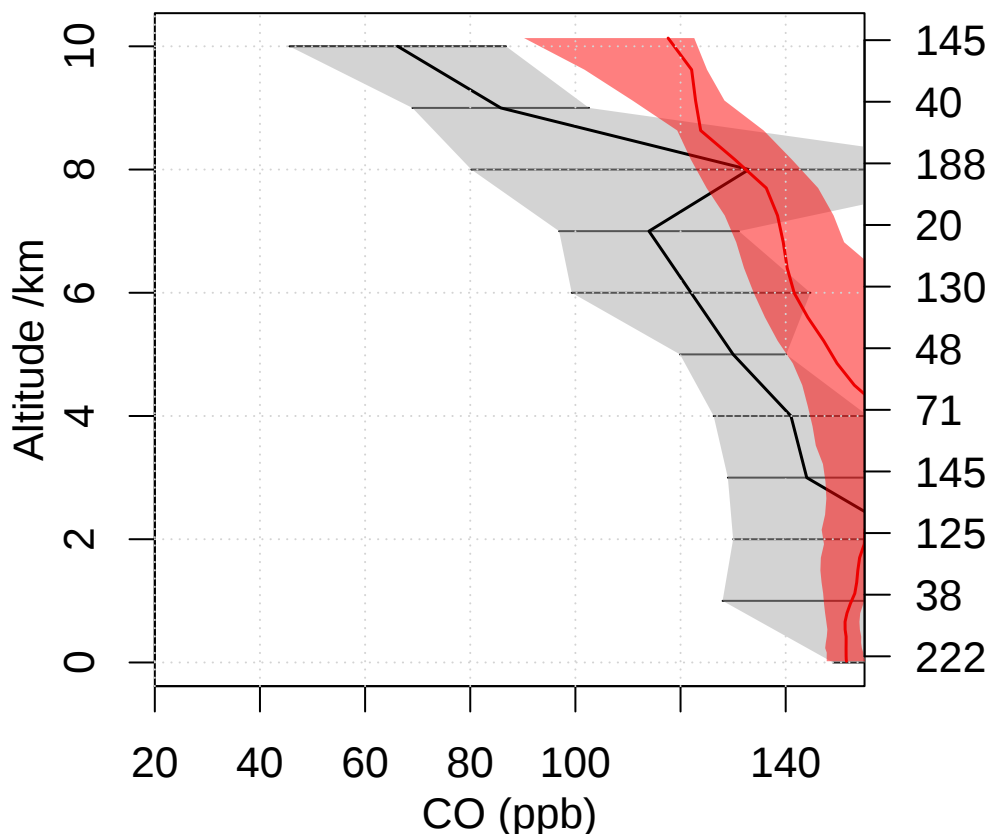
PEM-Tropics-B Christmas-Island 1999 07
Lat 0 – 10 Lon 200 – 220



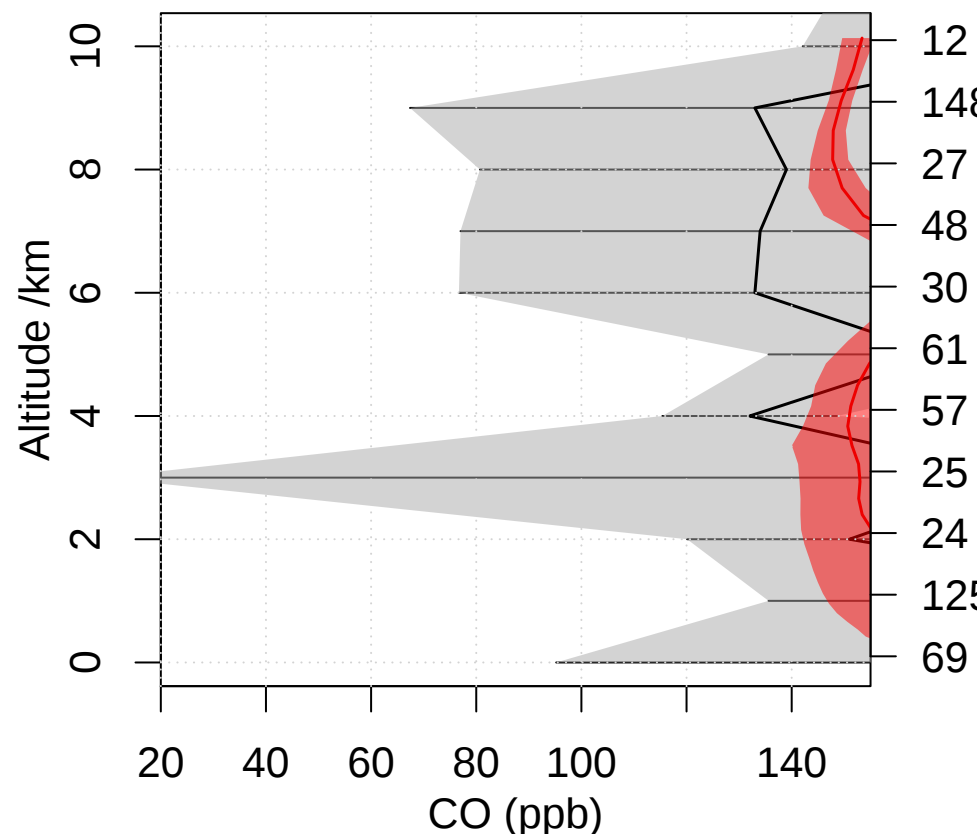
PEM-Tropics-B Tahiti 1999 03
Lat -20 – 0 Lon 200 – 230



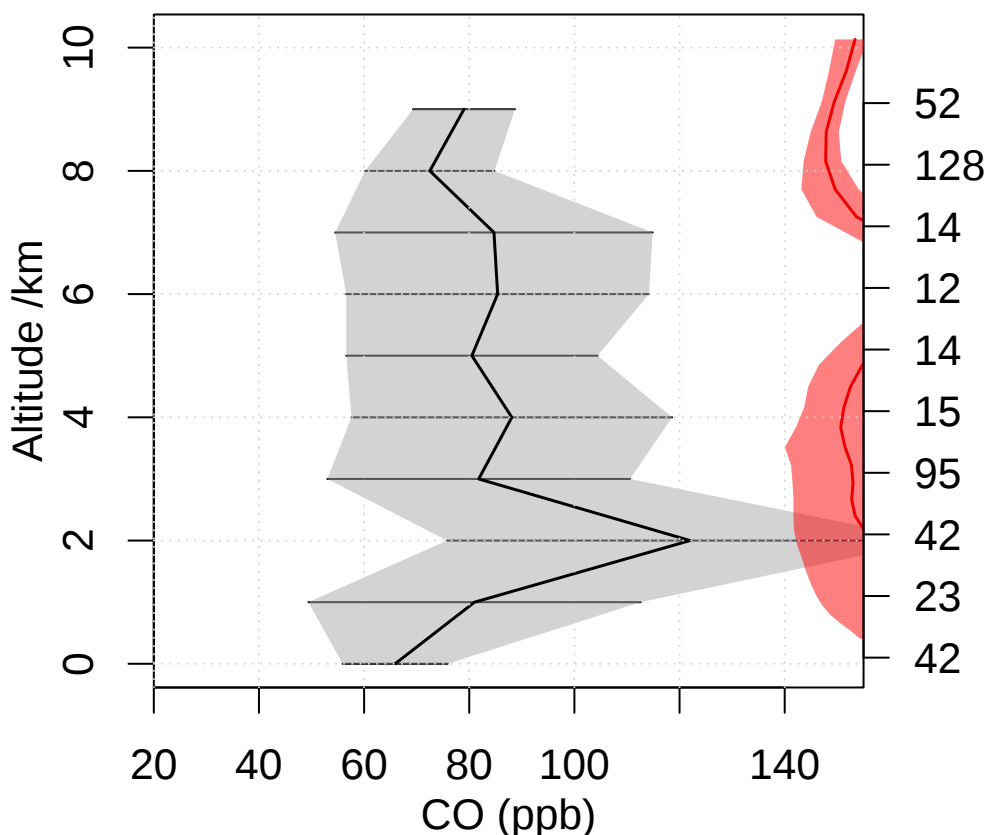
PEM-West-B Japan 1994 02
Lat 25 – 40 Lon 135 – 150



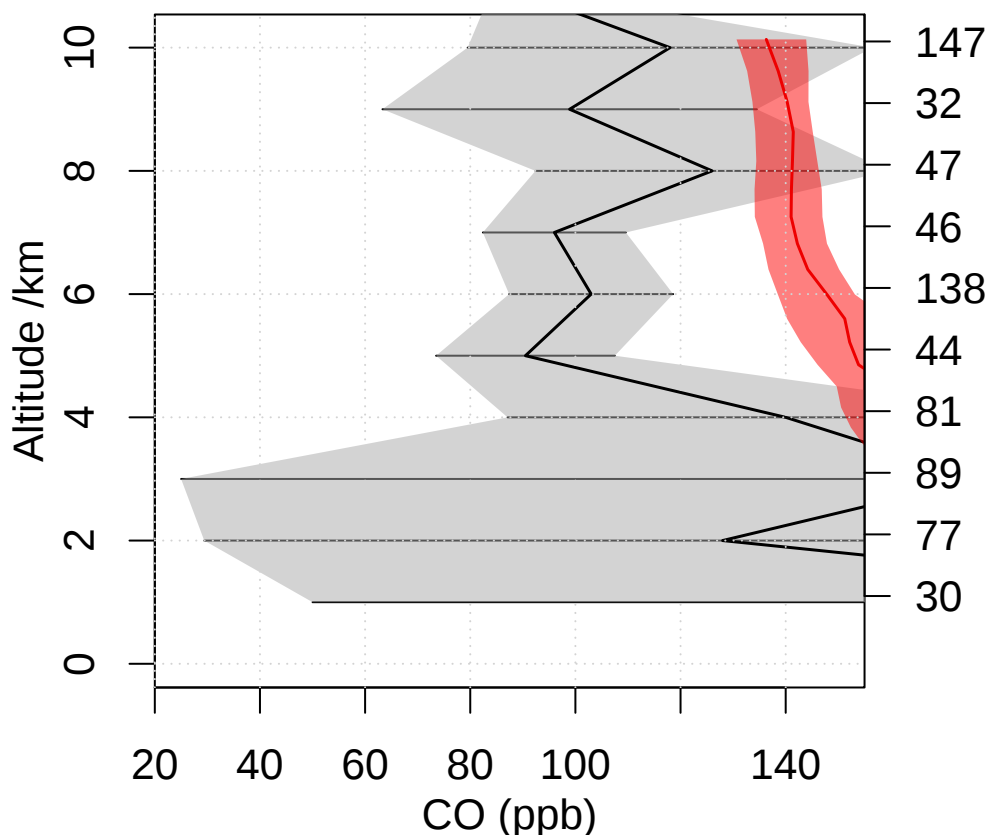
TRACE-A E-Brazil 1992 09
Lat -15 – -5 Lon 310 – 320



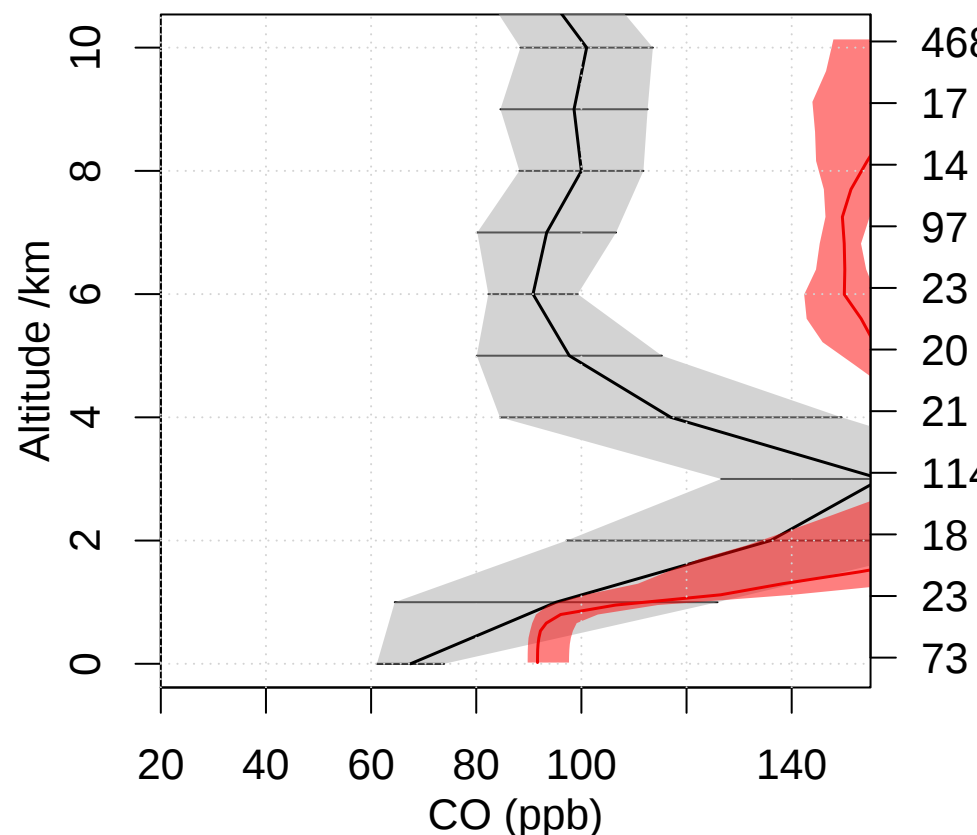
TRACE-A E-Brazil Coast 1992 09
Lat -35 – -25 Lon 310 – 320



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

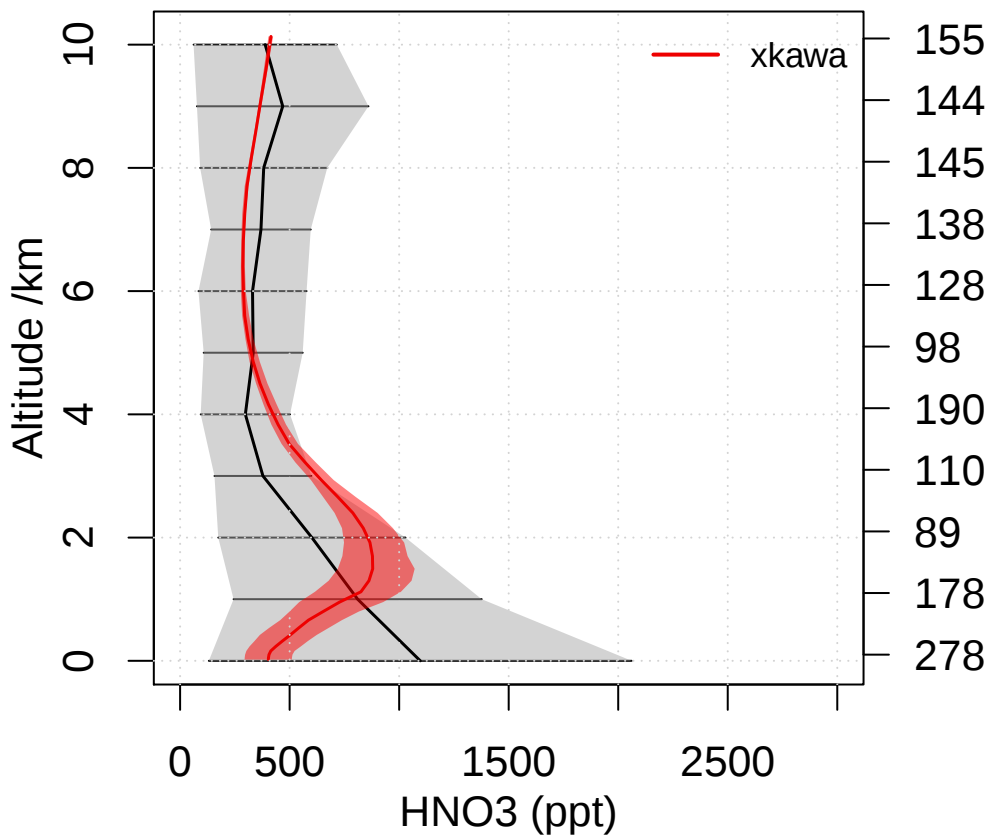


TRACE-A W-Africa Coast 1992 09
Lat -25 – -5 Lon 0 – 10

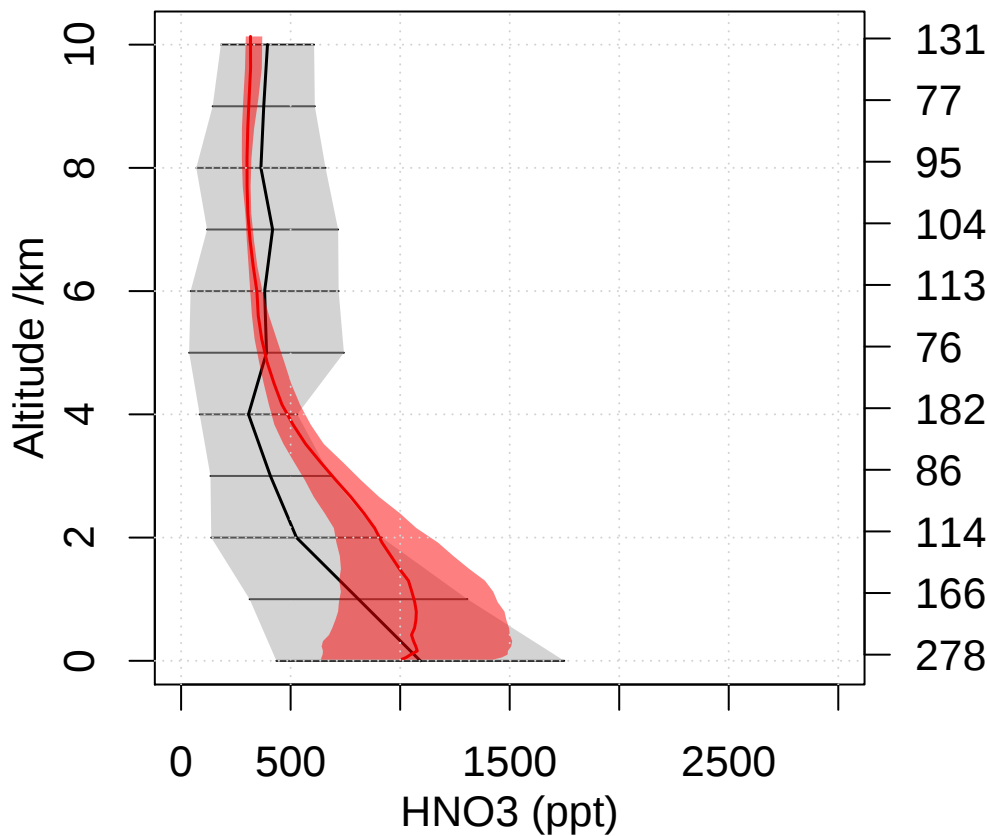


Emmons HNO3 comparison

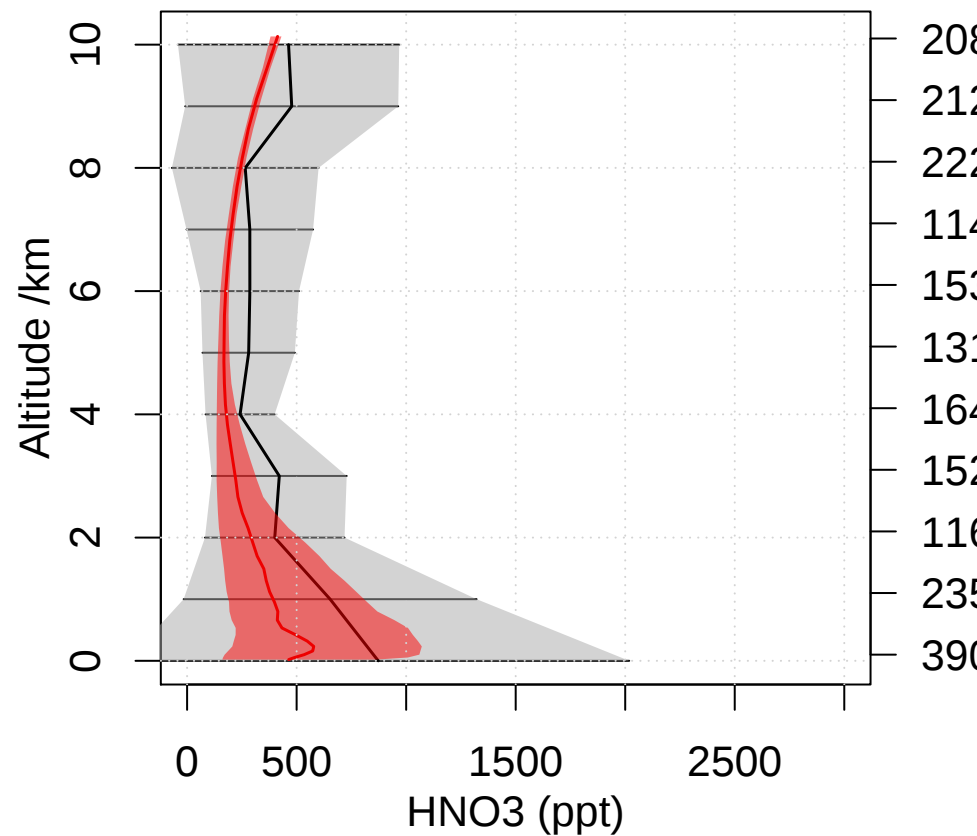
INTEX-NA East Coast 2004 07
Lat 32.5 – 40 Lon 296.5 – 307



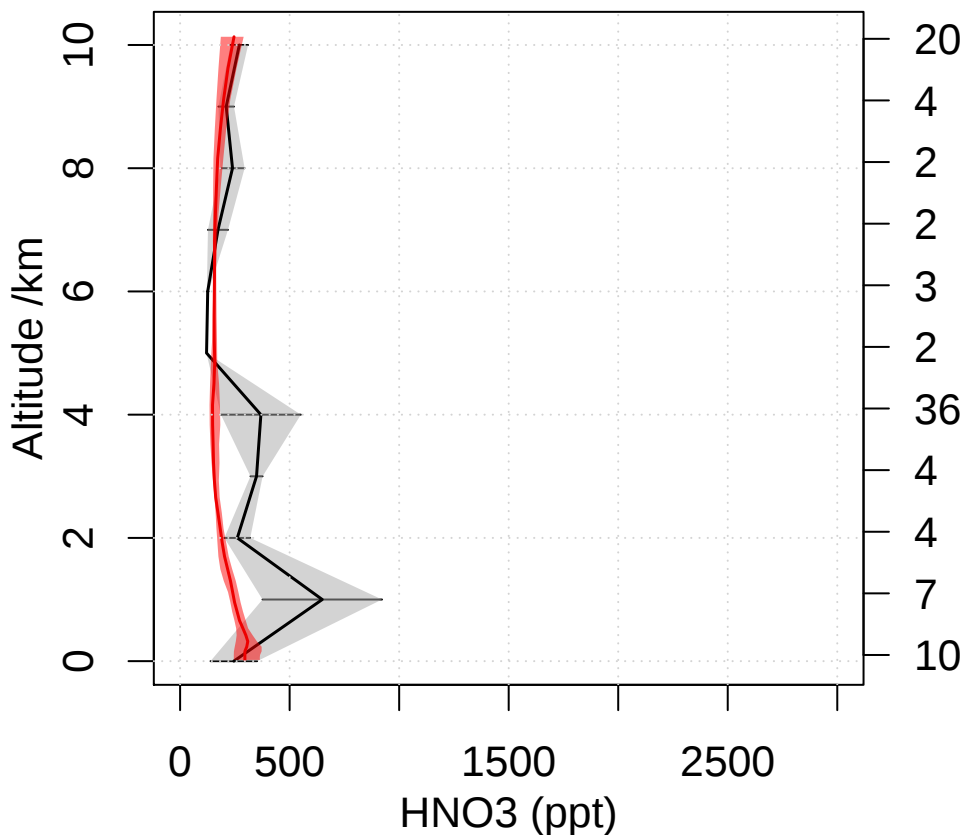
INTEX-NA Central 2004 07
Lat 30 – 40 Lon 259.5 – 285



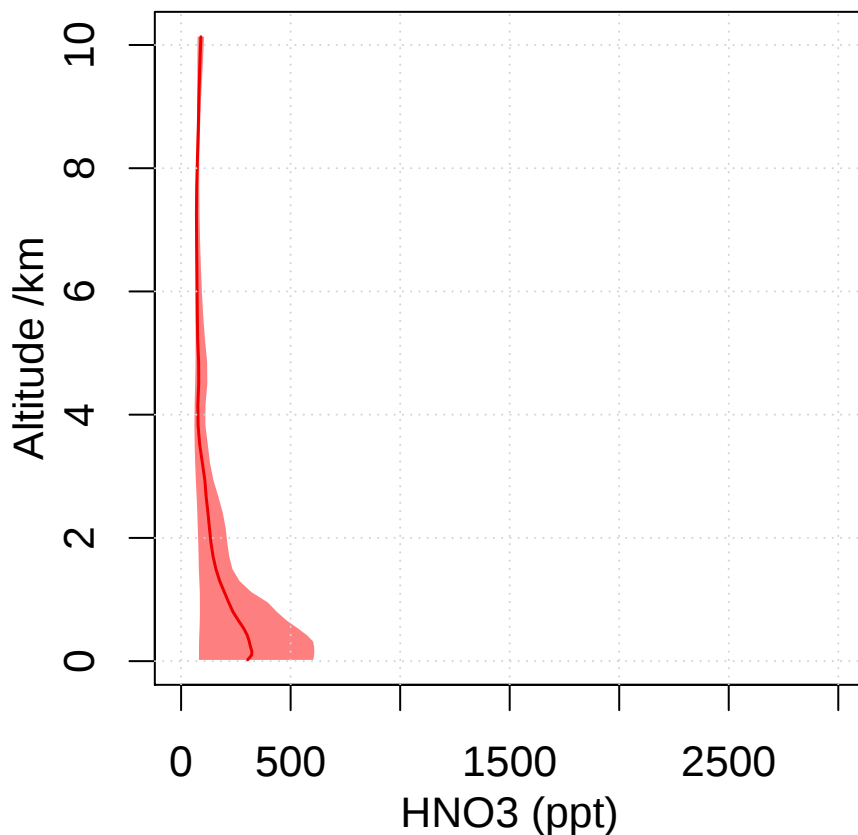
INTEX-NA North East 2004 07
Lat 42.5 – 52.5 Lon 285 – 310



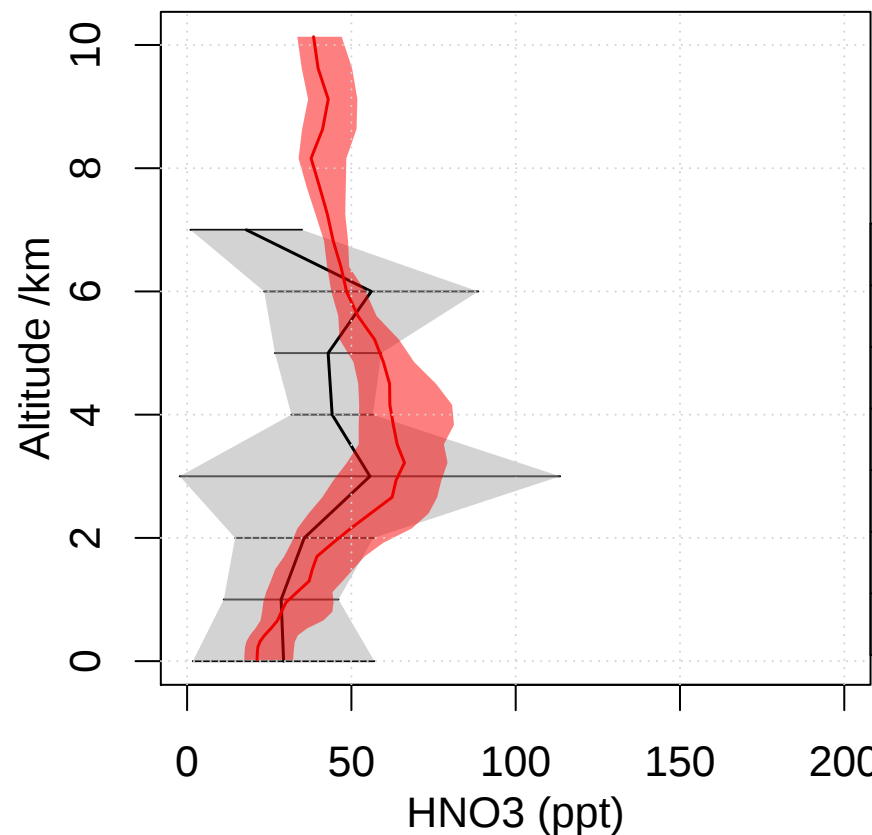
INTEX-NA West Coast 2004 07
Lat 32.5 – 45 Lon 217 – 240



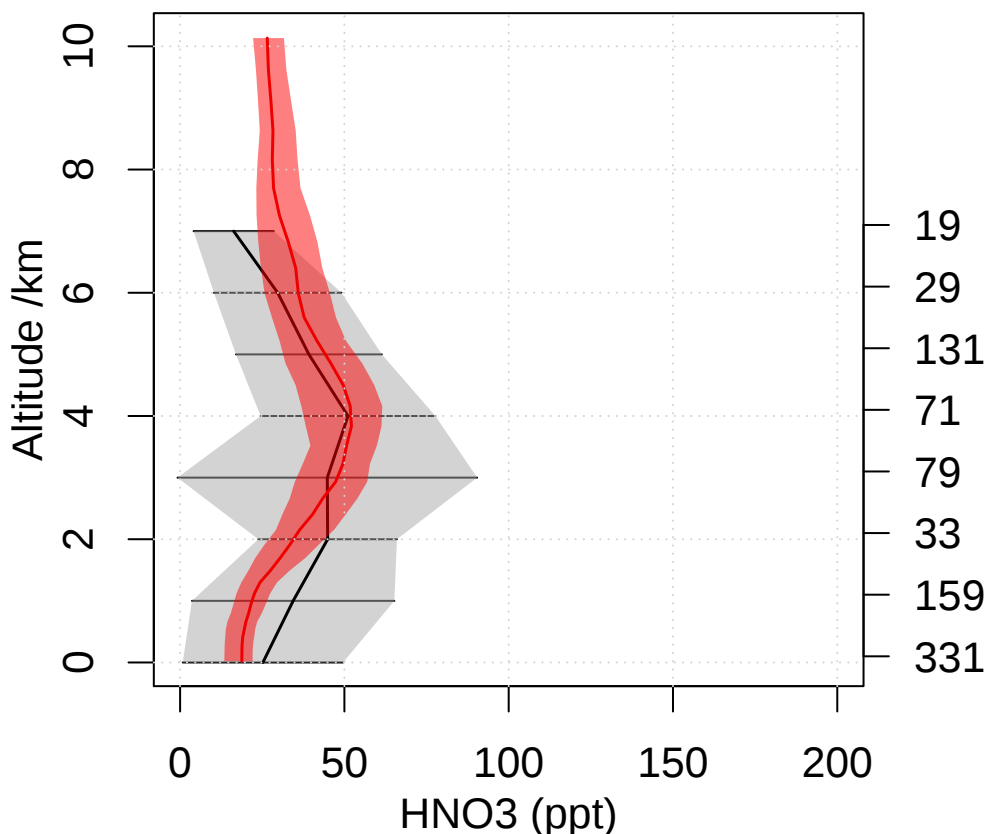
OP3 2008 07
Lat 2.5 – 7.5 Lon 112.5 – 120



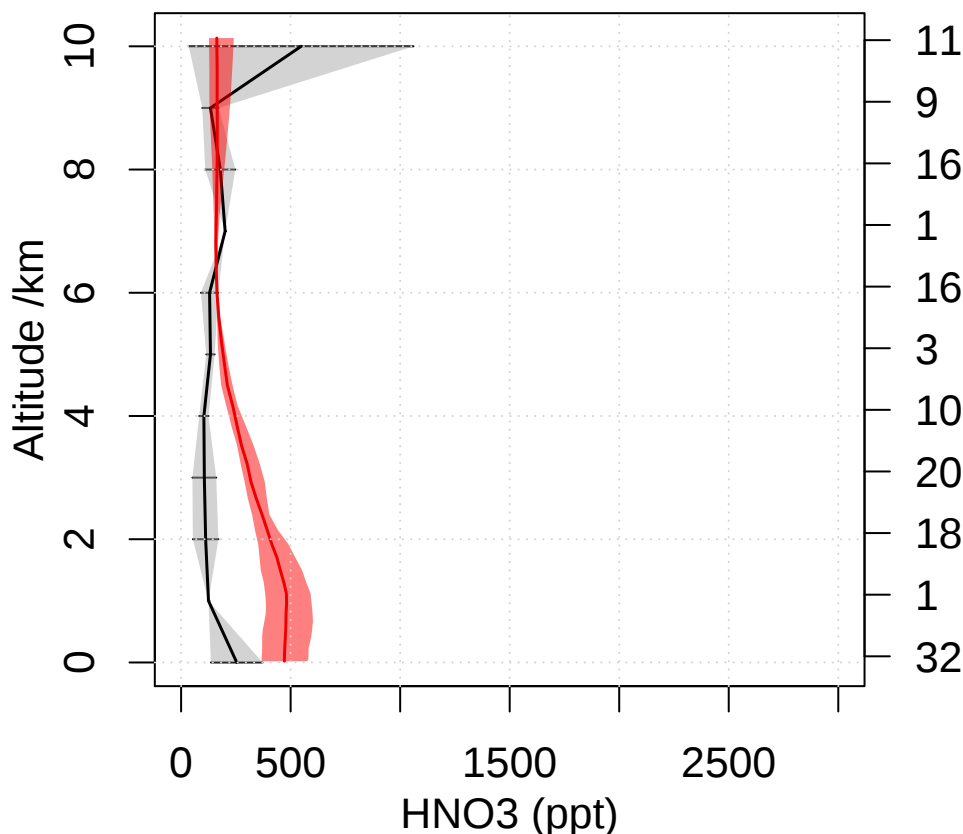
PEM-Tropics-B Christmas-Island 1999 07
Lat 0 – 10 Lon 200 – 220



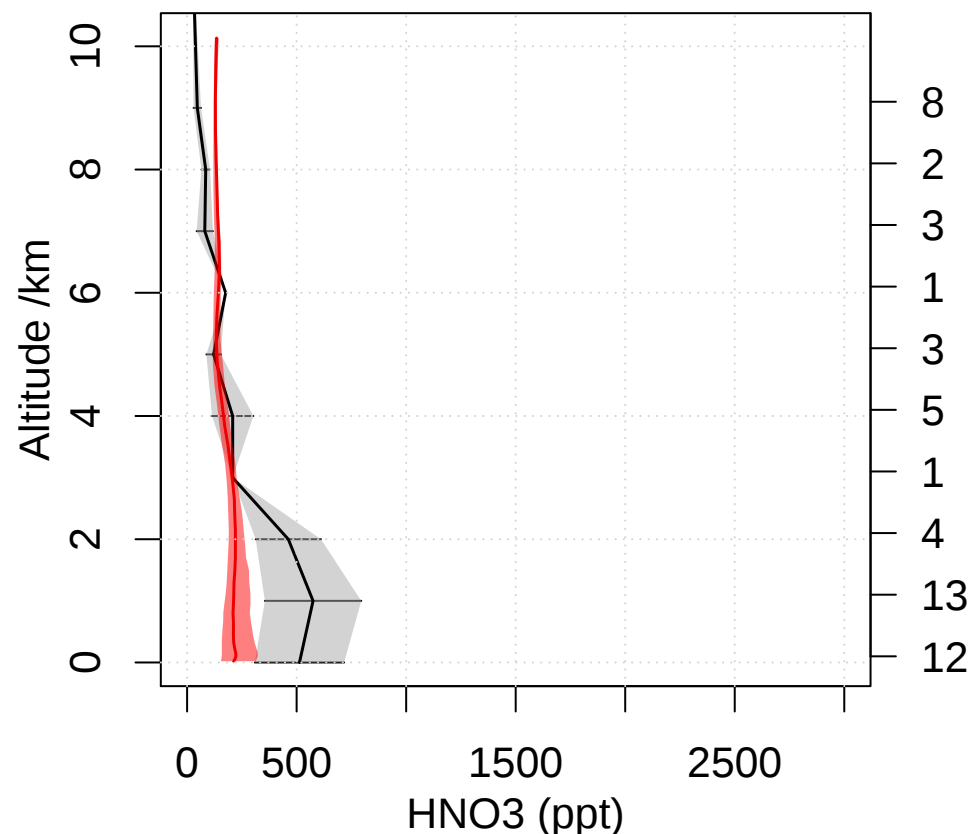
PEM-Tropics-B Tahiti 1999 03
Lat -20 – 0 Lon 200 – 230



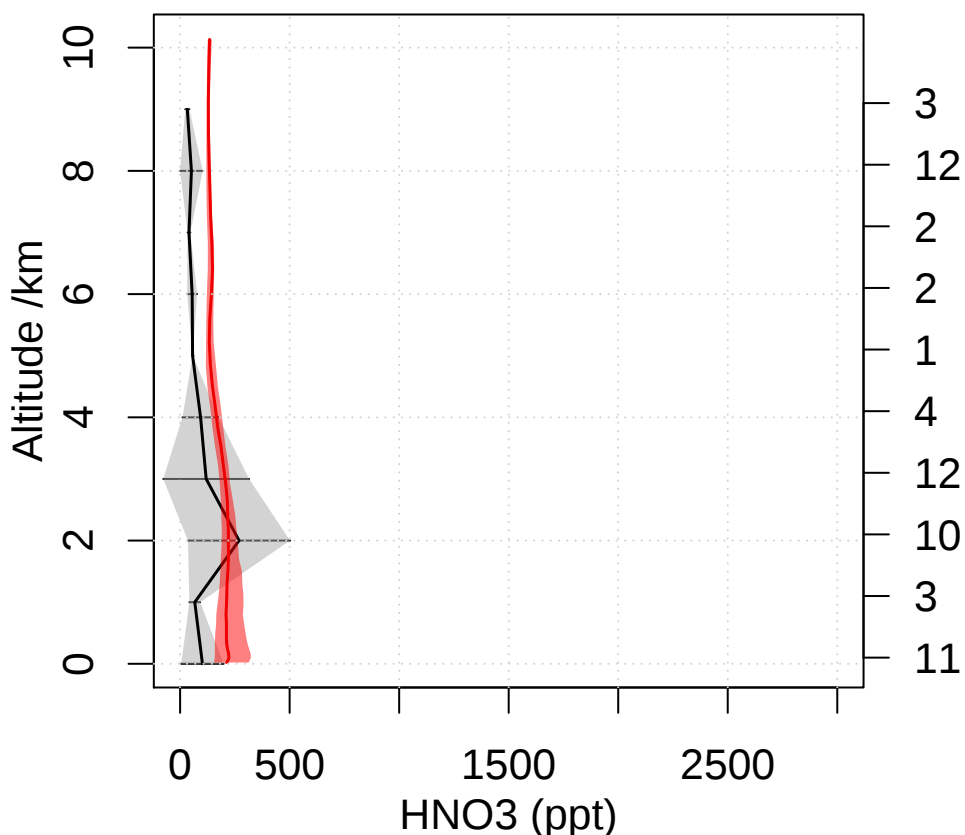
PEM-West-B Japan 1994 02
Lat 25 – 40 Lon 135 – 150



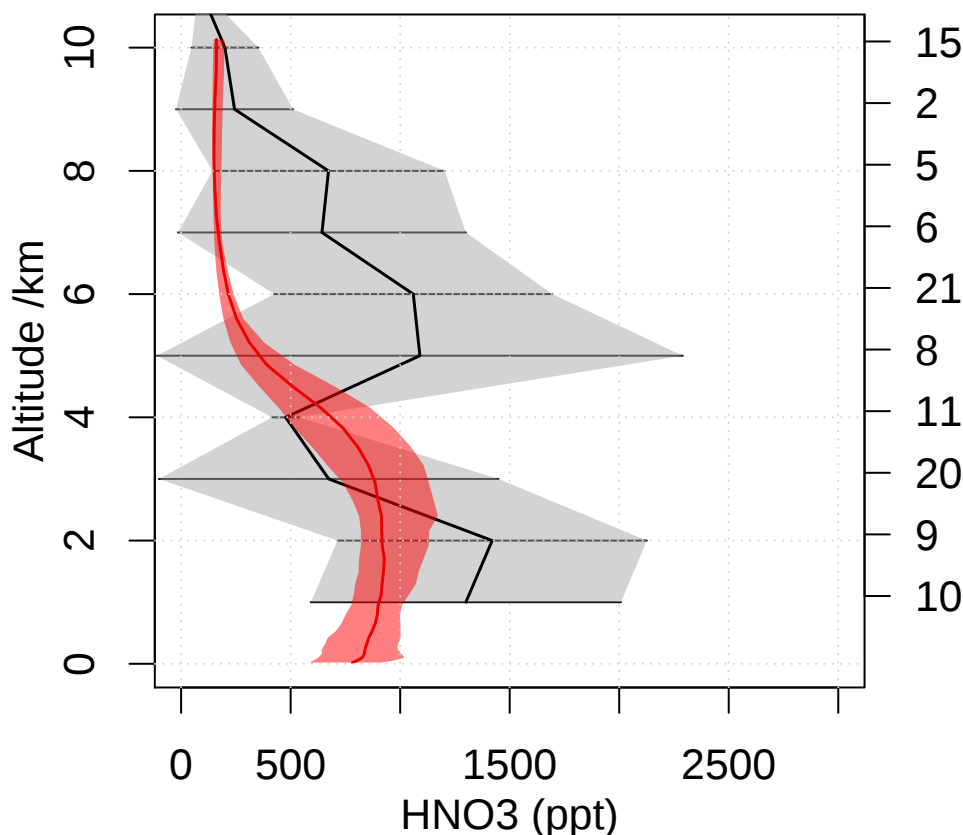
TRACE-A E-Brazil 1992 09
Lat -15 – -5 Lon 310 – 320



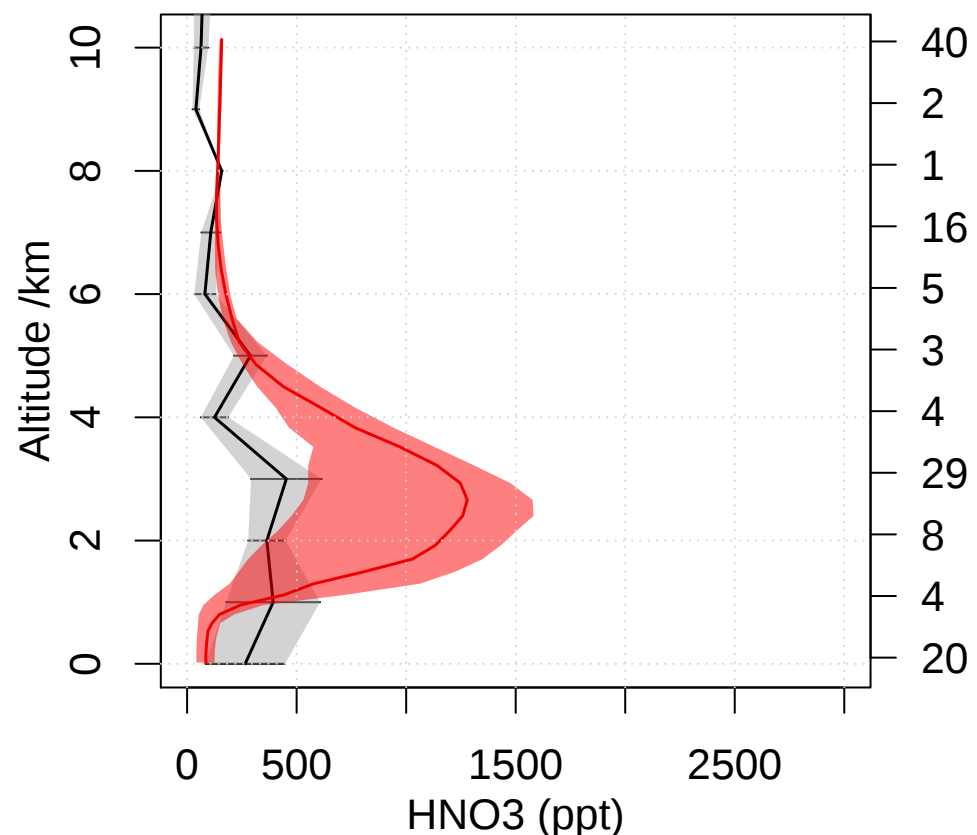
TRACE-A E-Brazil Coast 1992 09
Lat -35 – -25 Lon 310 – 320



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

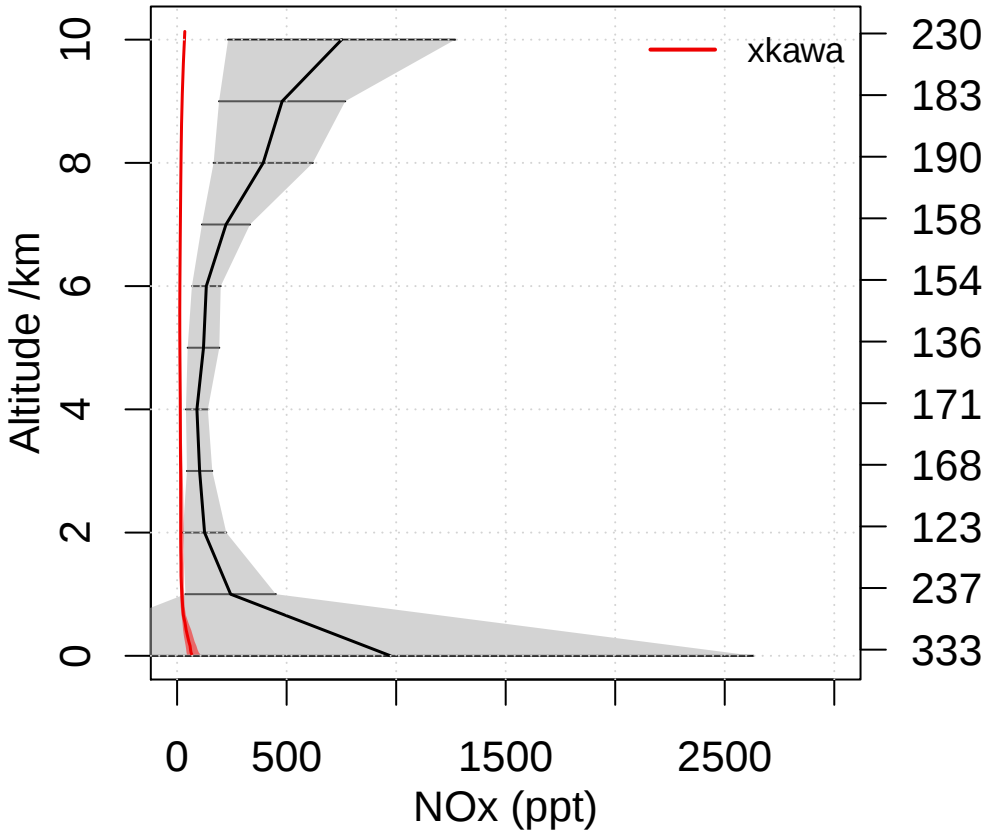


TRACE-A W-Africa Coast 1992 09
Lat -25 – -5 Lon 0 – 10

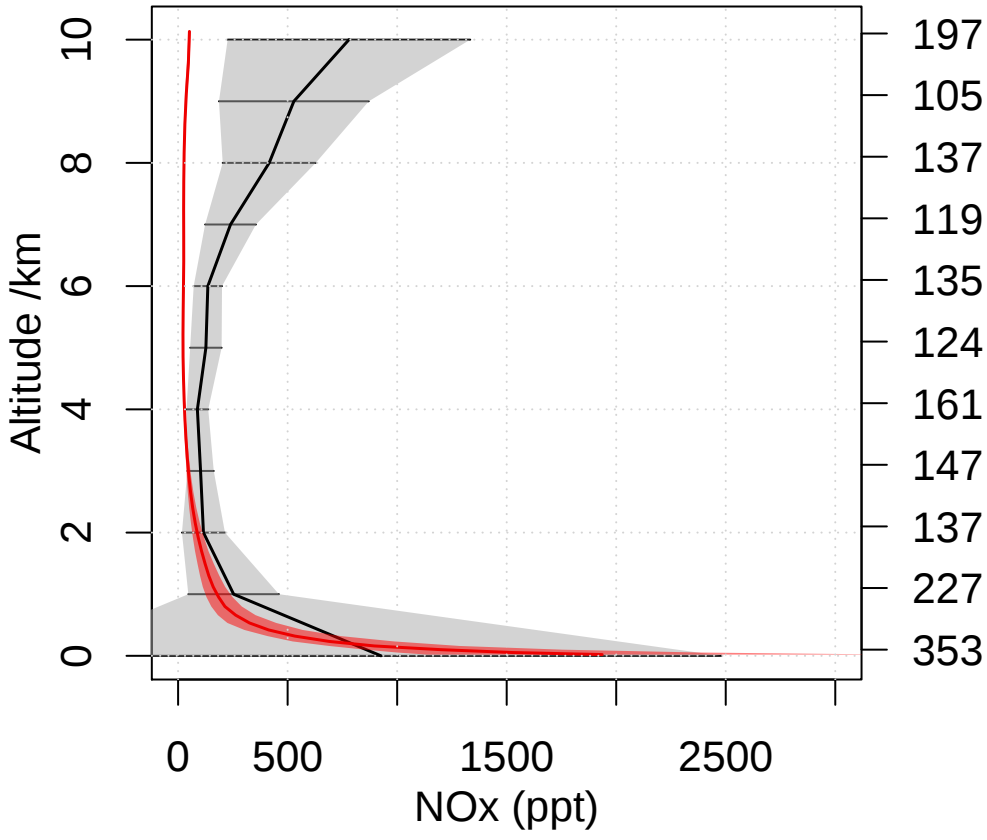


Emmons NOx comparison

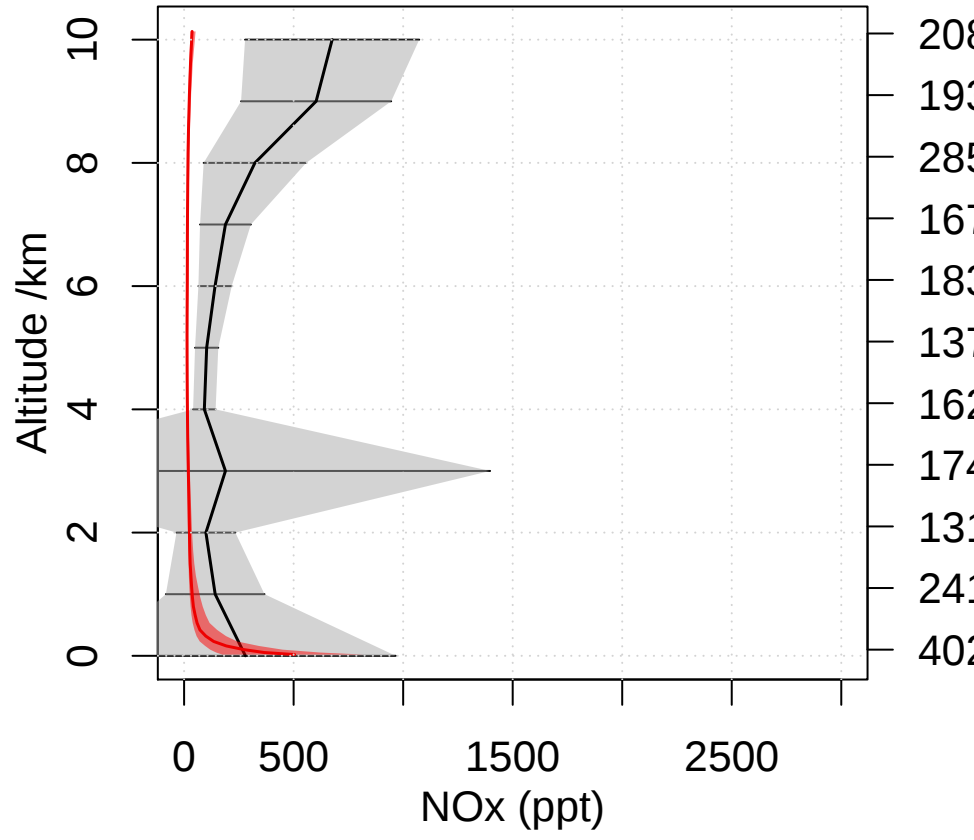
INTEX-NA East Coast 2004 07
Lat 32.5 – 40 Lon 296.5 – 307



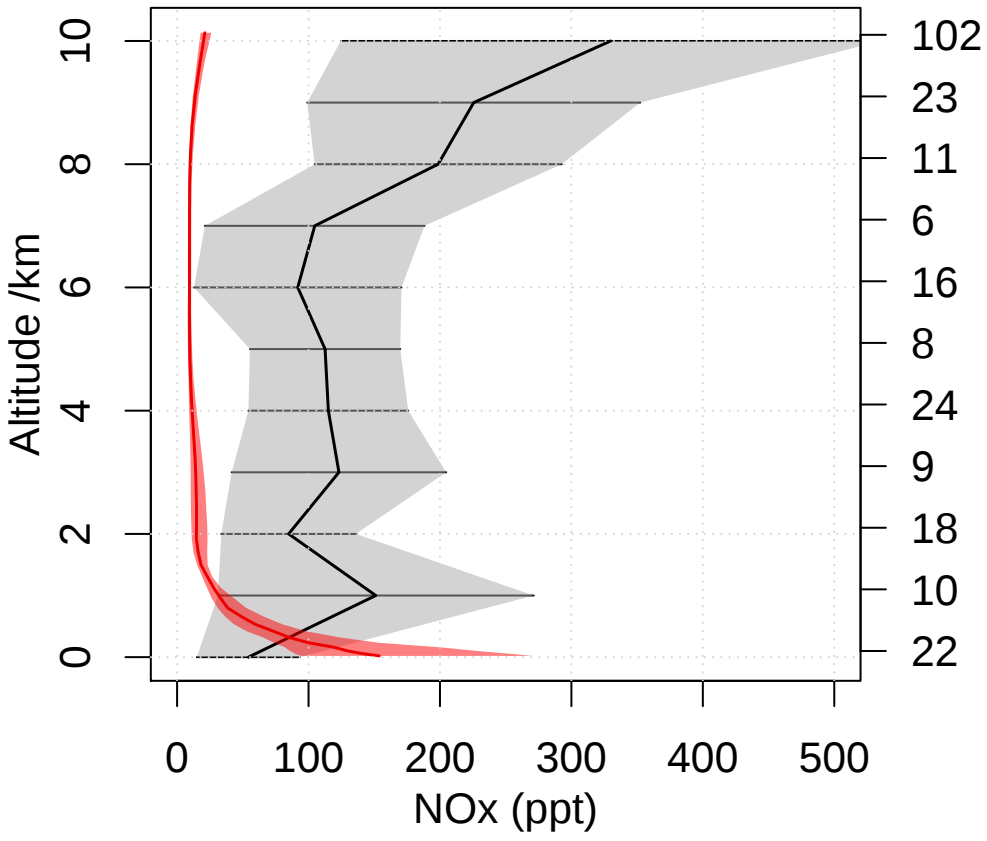
INTEX-NA Central 2004 07
Lat 30 – 40 Lon 259.5 – 285



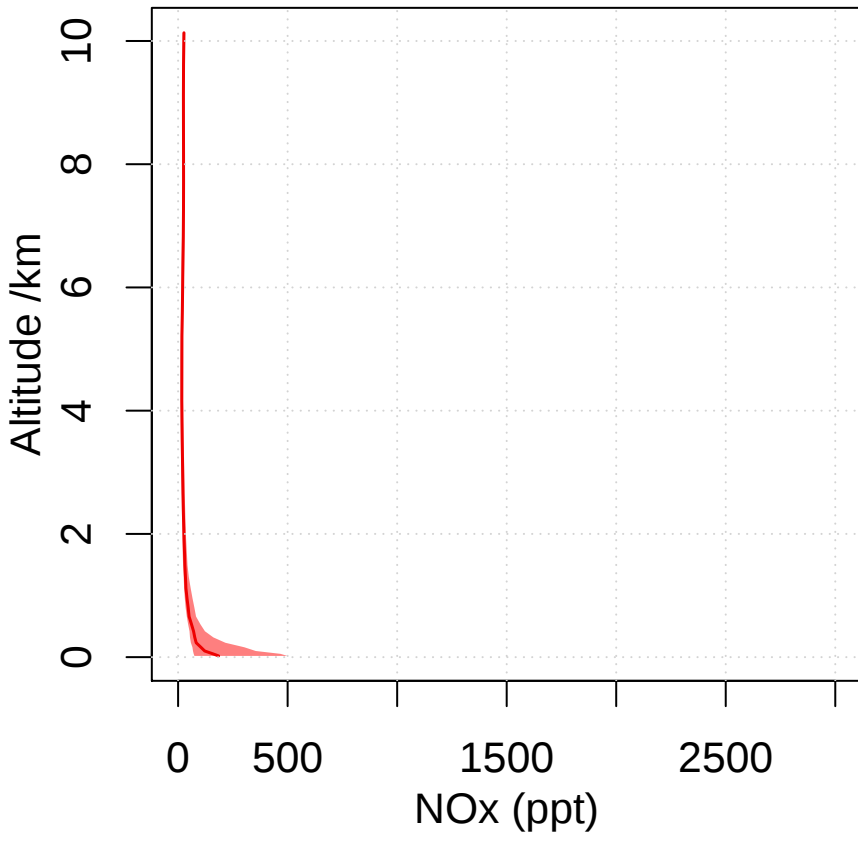
INTEX-NA North East 2004 07
Lat 42.5 – 52.5 Lon 285 – 310



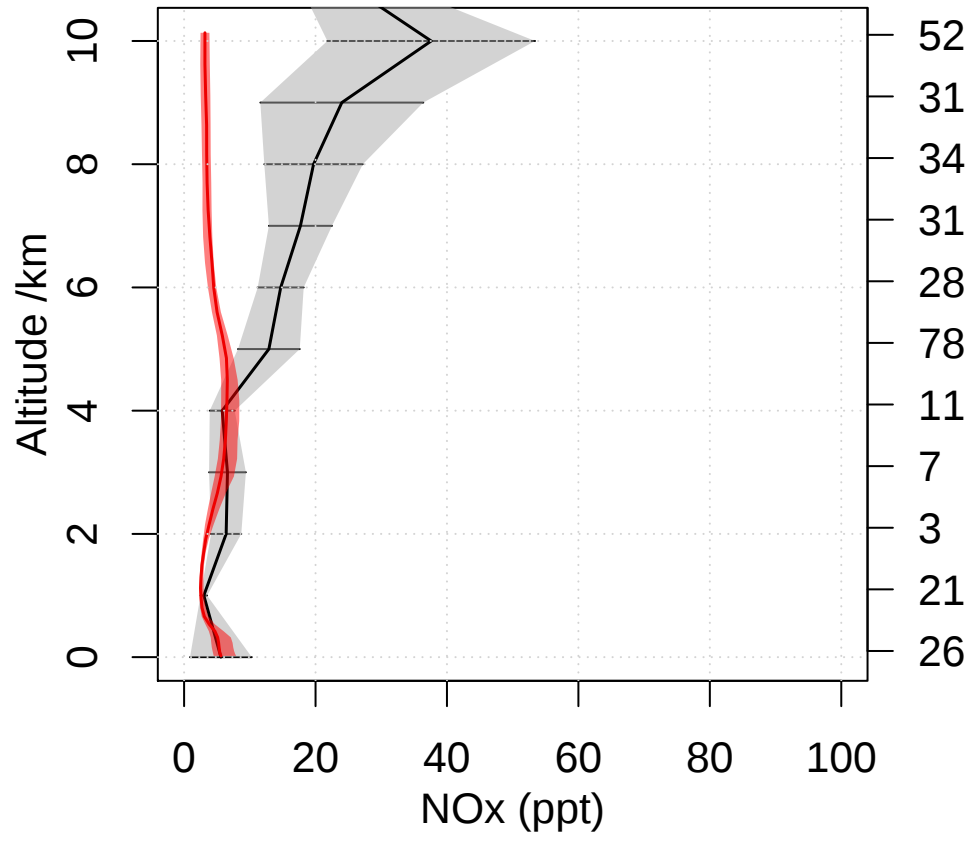
INTEX-NA West Coast 2004 07
Lat 32.5 – 45 Lon 217 – 240



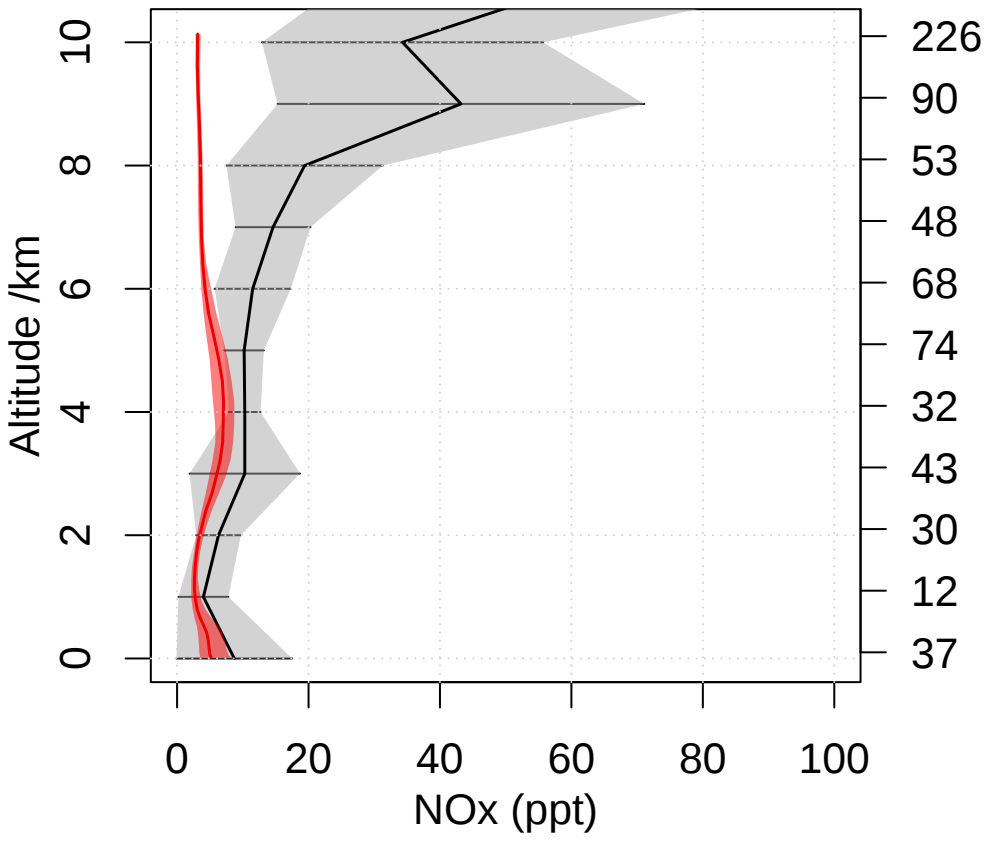
OP3 2008 07
Lat 2.5 – 7.5 Lon 112.5 – 120



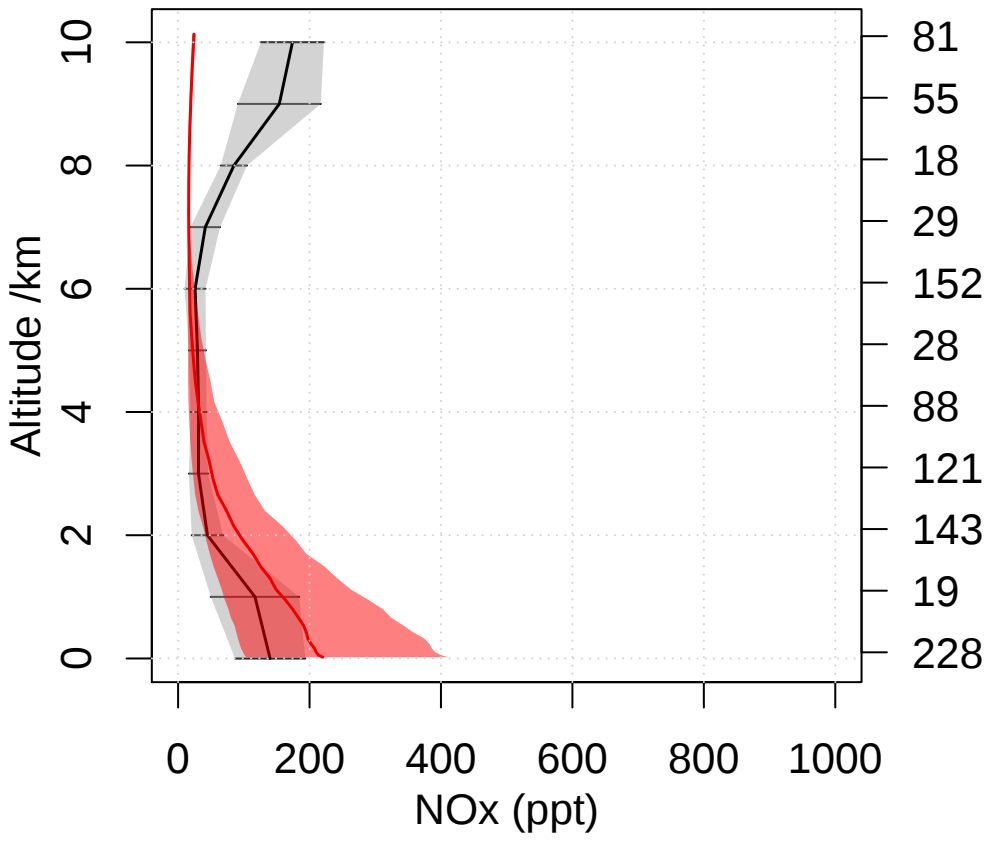
PEM-Tropics-B Christmas-Island 1999 07
Lat 0 – 10 Lon 200 – 220



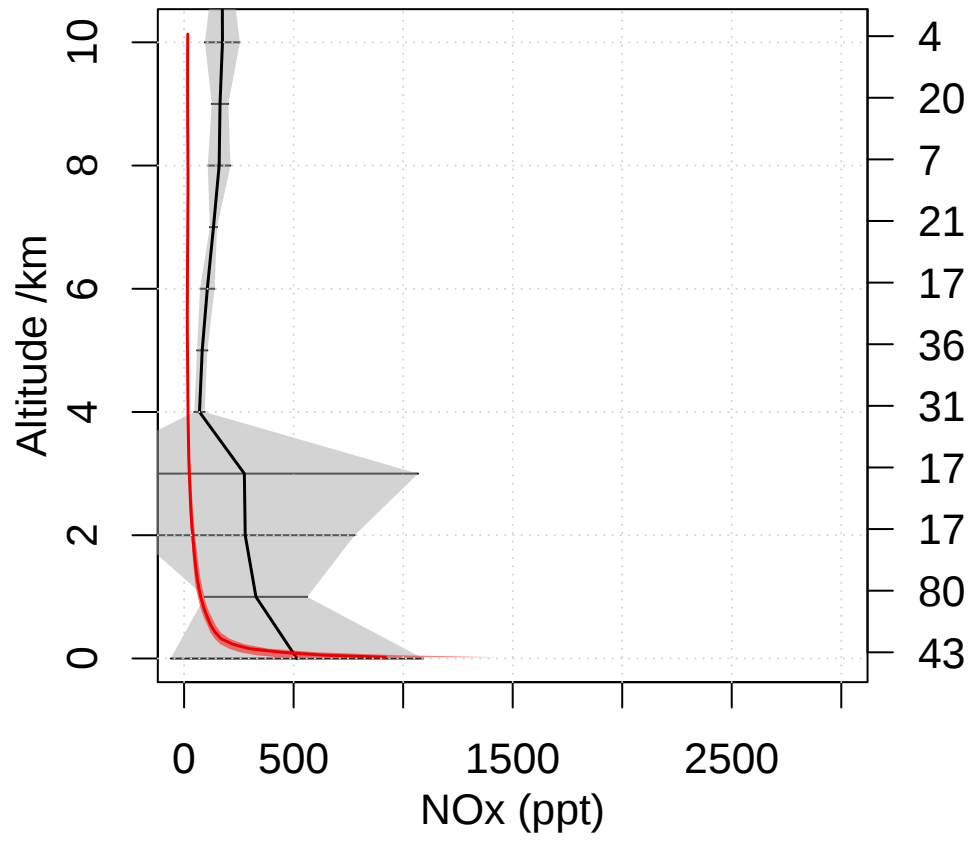
PEM-Tropics-B Tahiti 1999 03
Lat -20 – 0 Lon 200 – 230



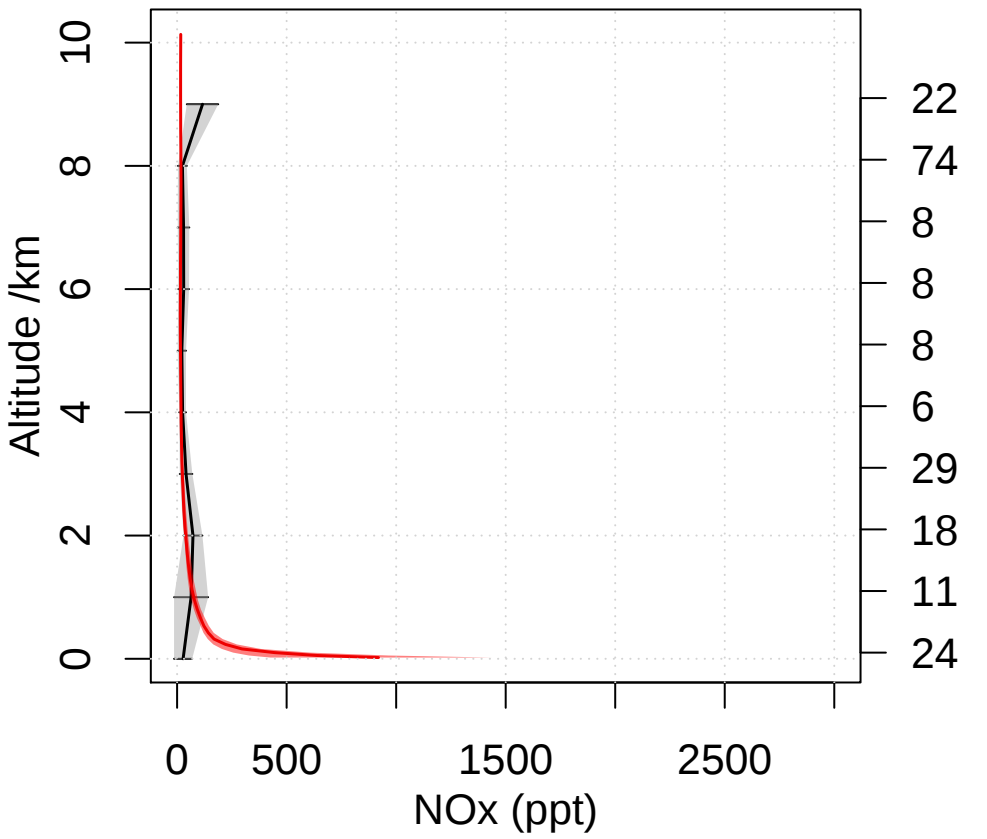
PEM-West-B Japan 1994 02
Lat 25 – 40 Lon 135 – 150



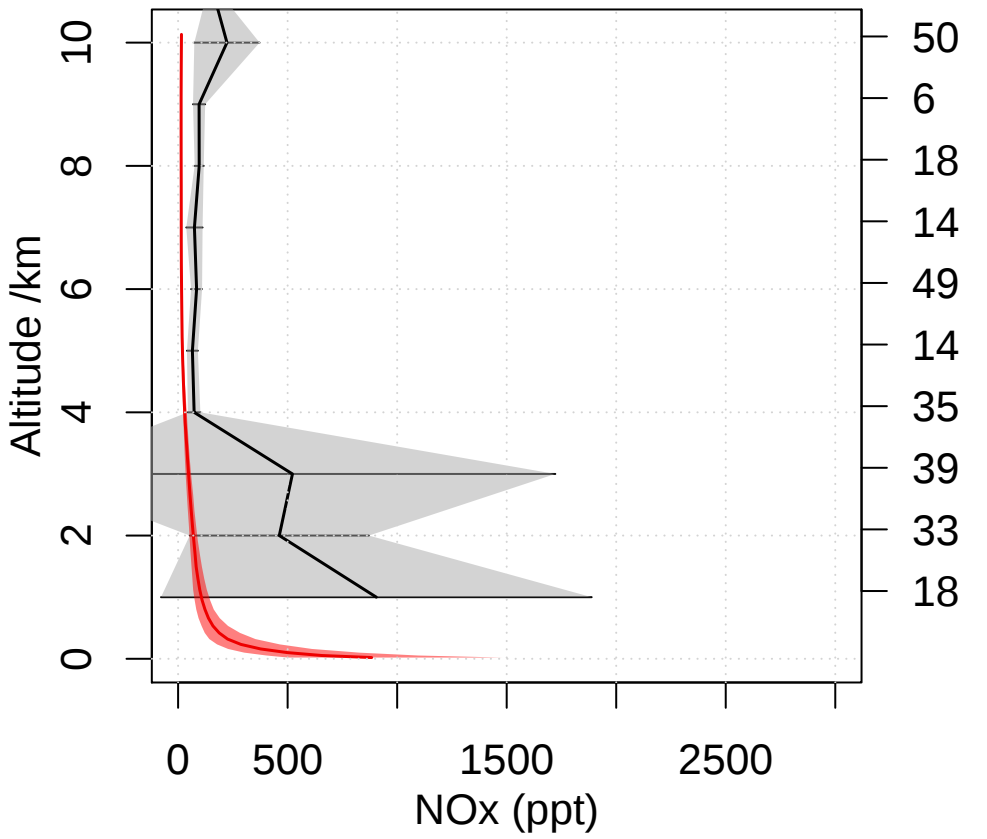
TRACE-A E-Brazil 1992 09
Lat -15 – -5 Lon 310 – 320



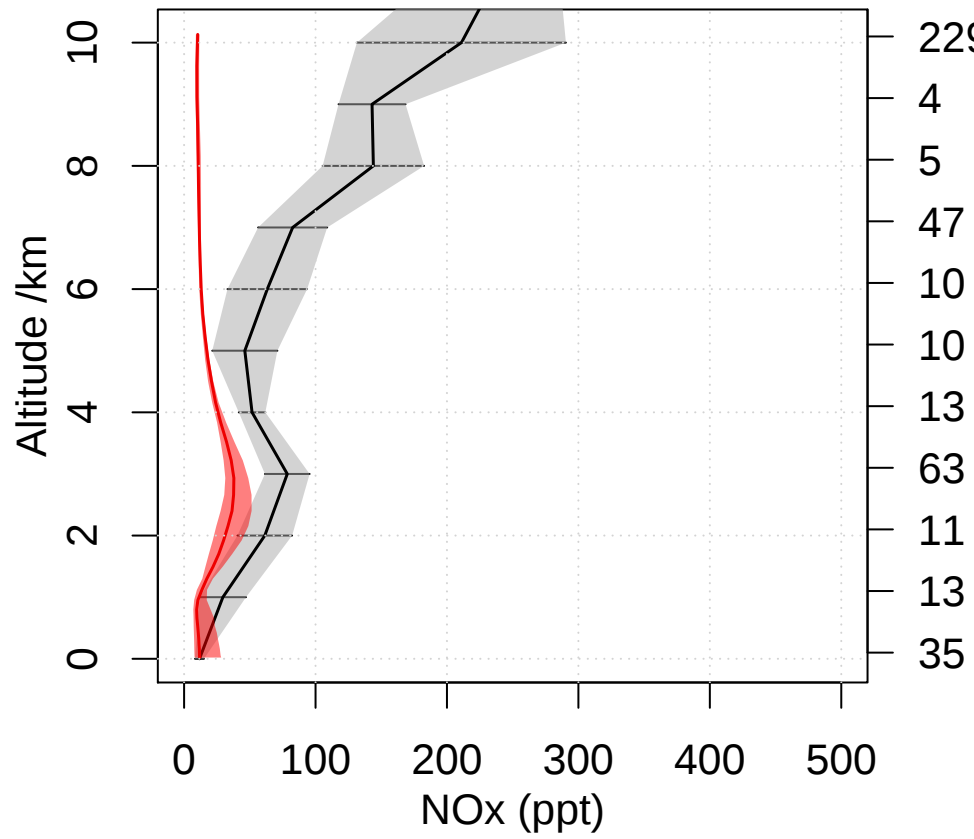
TRACE-A E-Brazil Coast 1992 09
Lat -35 – -25 Lon 310 – 320



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

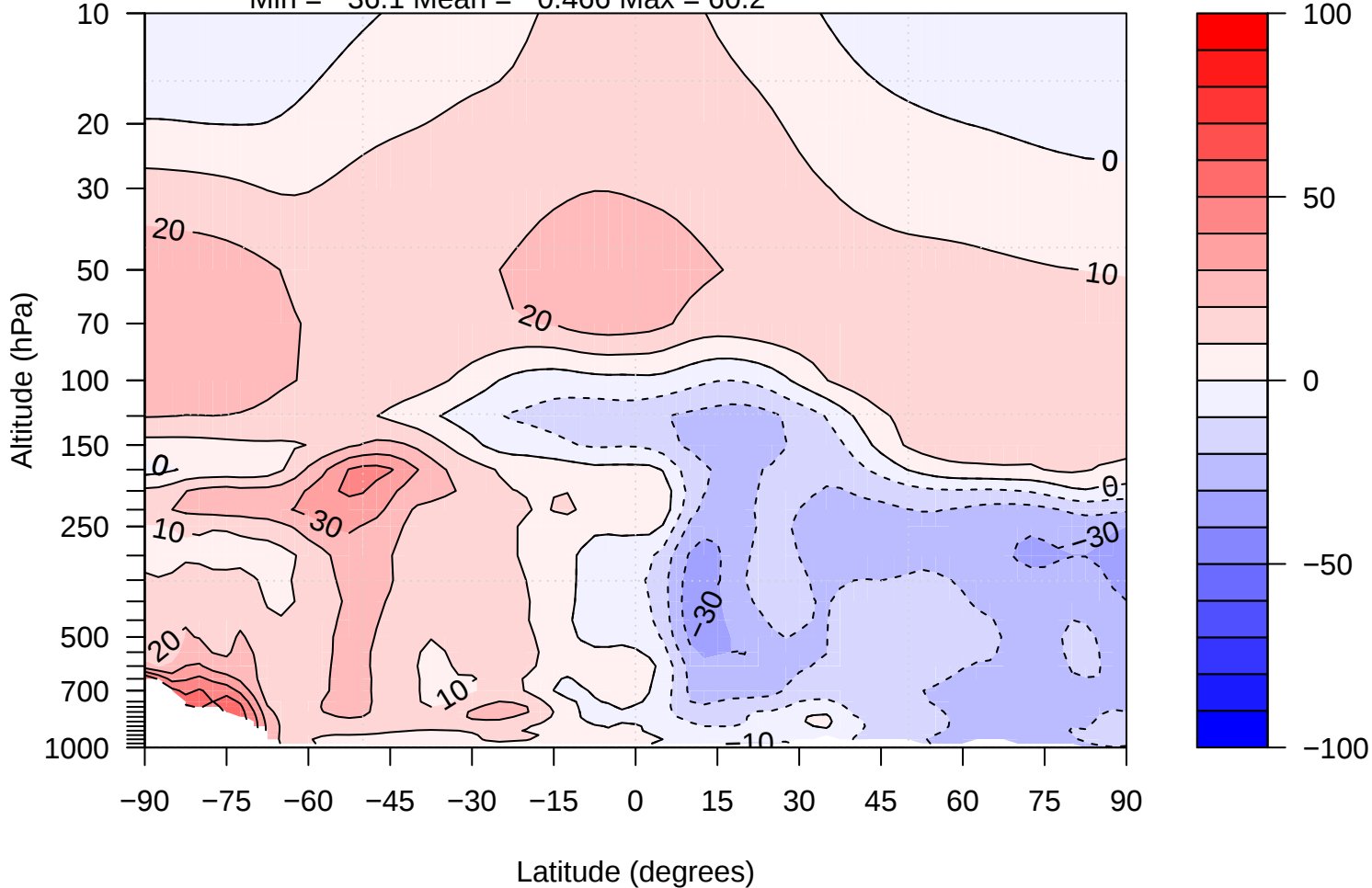


TRACE-A W-Africa Coast 1992 09
Lat -25 – -5 Lon 0 – 10



xkawa - ERA Q bias

Min = -36.1 Mean = -0.466 Max = 60.2



[OH] Air mass weighted

UKCA xkawa

Red: Spivakovsky values

(10^6 molecules cm^{-3})

Mean OH = $7.91\text{e}+05$

Values in (): Std dev

Pressure (hPa)

250

500

750

1000

0.21

0.64

(0.17)

0.76

1.43

(0.17)

0.93

1.36

(0.16)

0.42

0.64

(0.25)

0.28

0.72

(0.24)

1.2

2

(0.26)

1.5

1.99

(0.19)

0.63

0.88

(0.34)

0.25

0.47

(0.29)

1.4

1.44

(0.17)

1.8

1.52

(0.21)

0.74

0.76

(0.56)

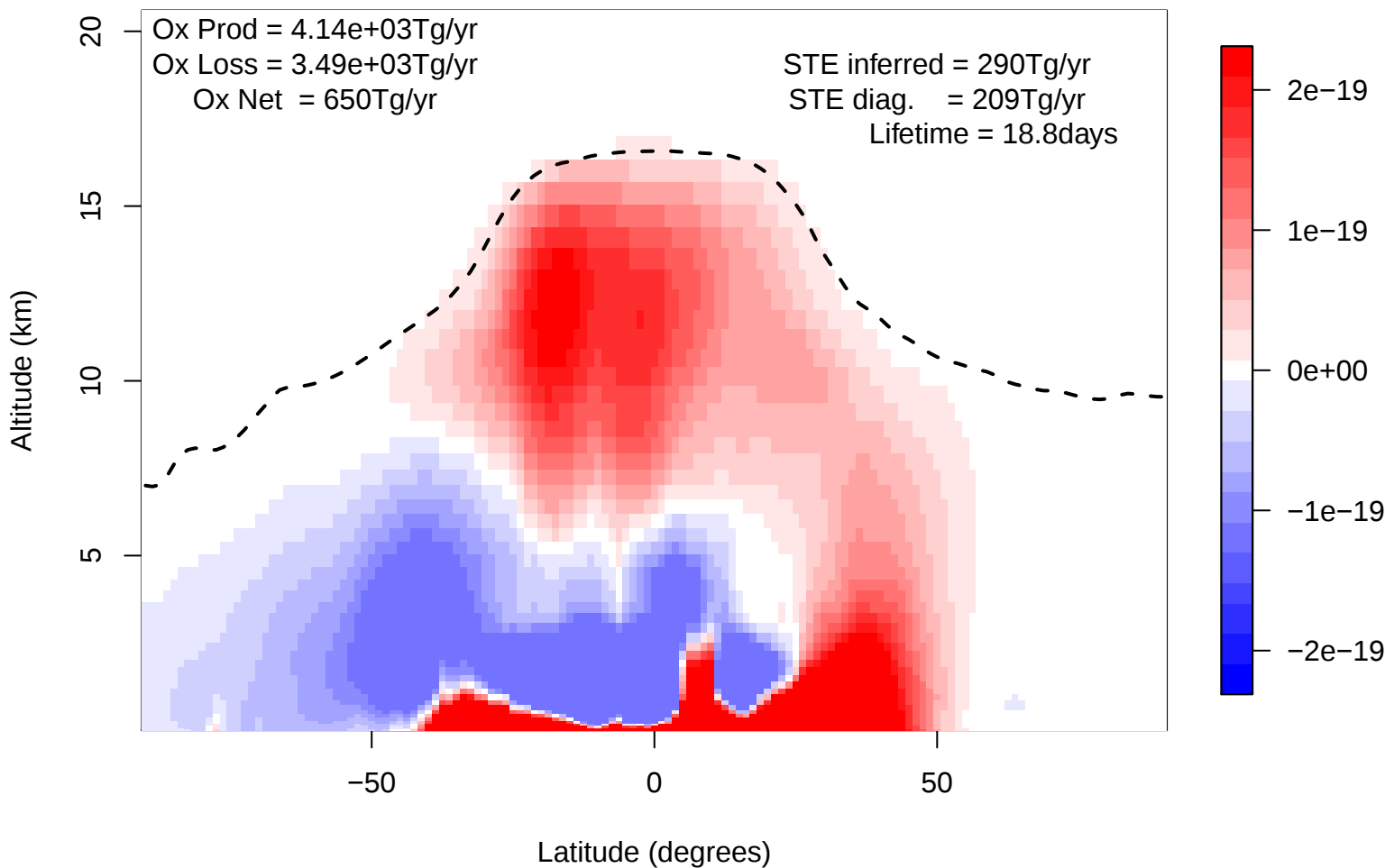
-50

0

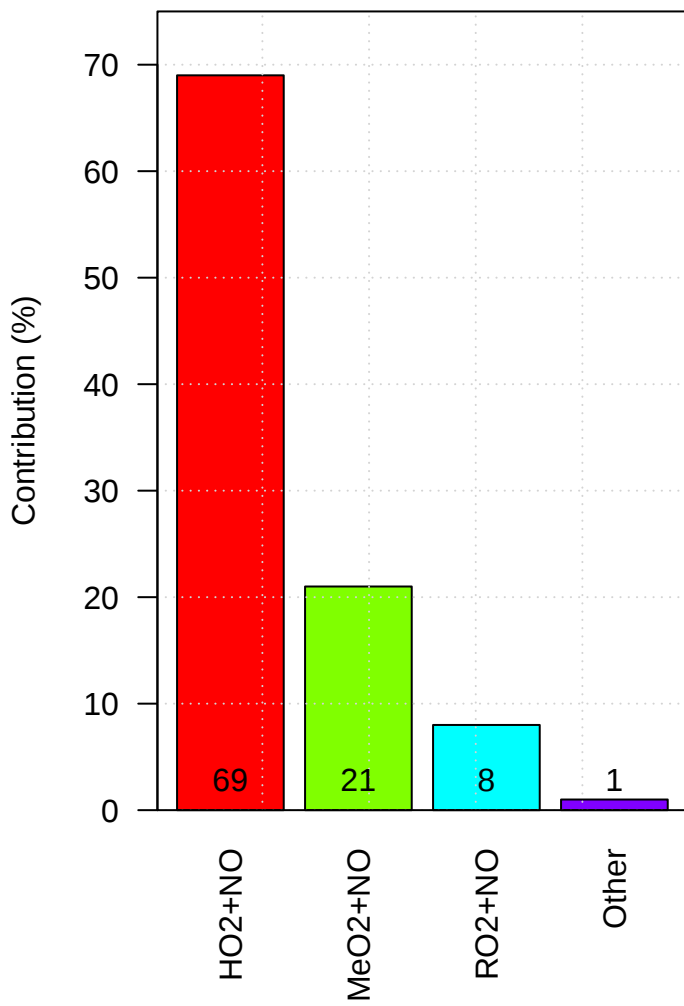
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Latitude

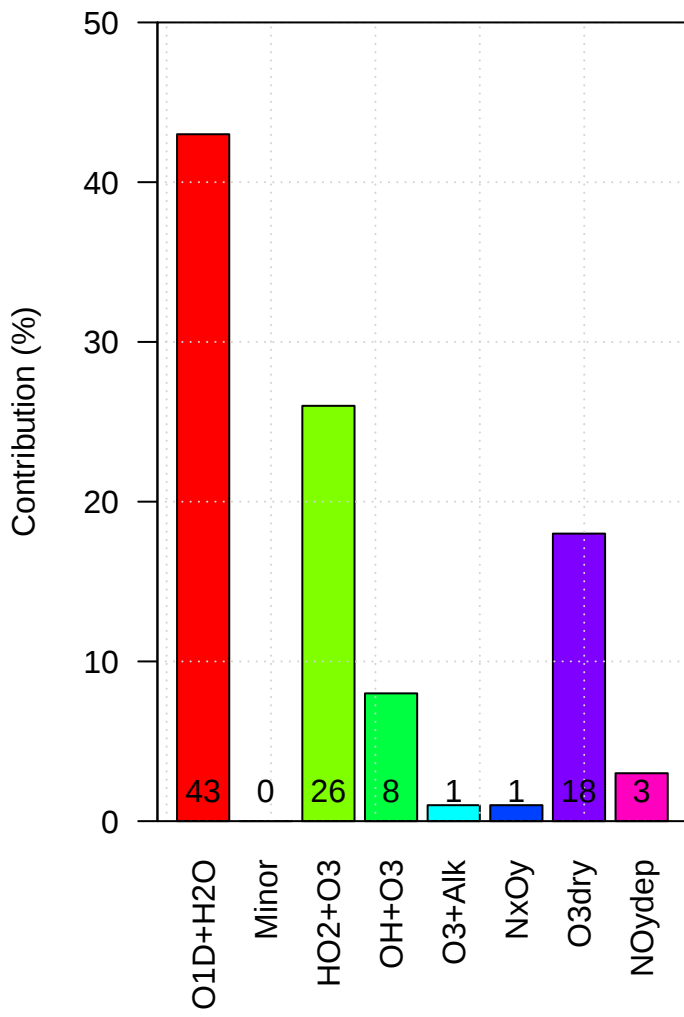
UKCA xkawa Ox Net Chemical Production



xkawa Production of Tropospheric Ox

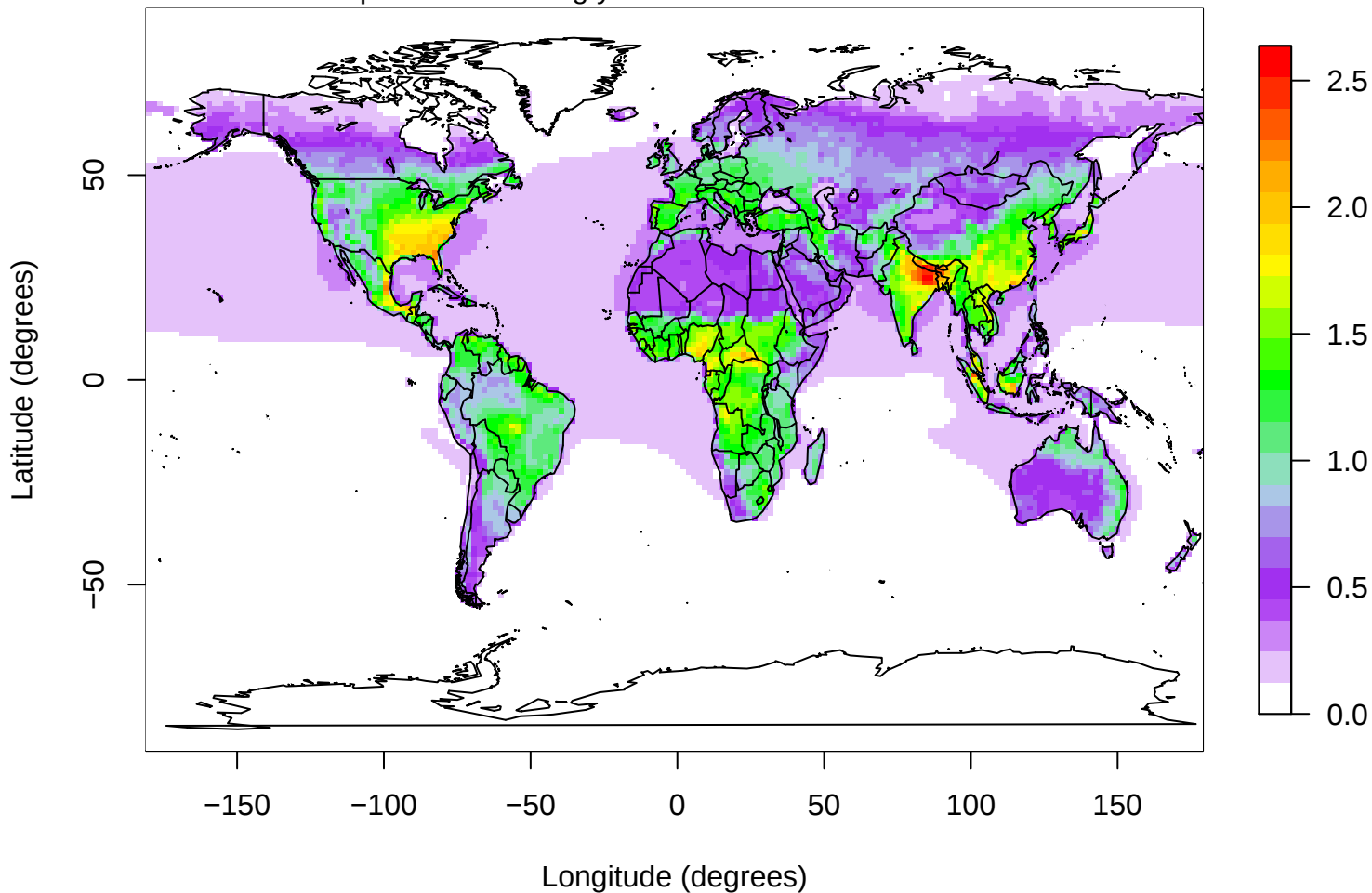


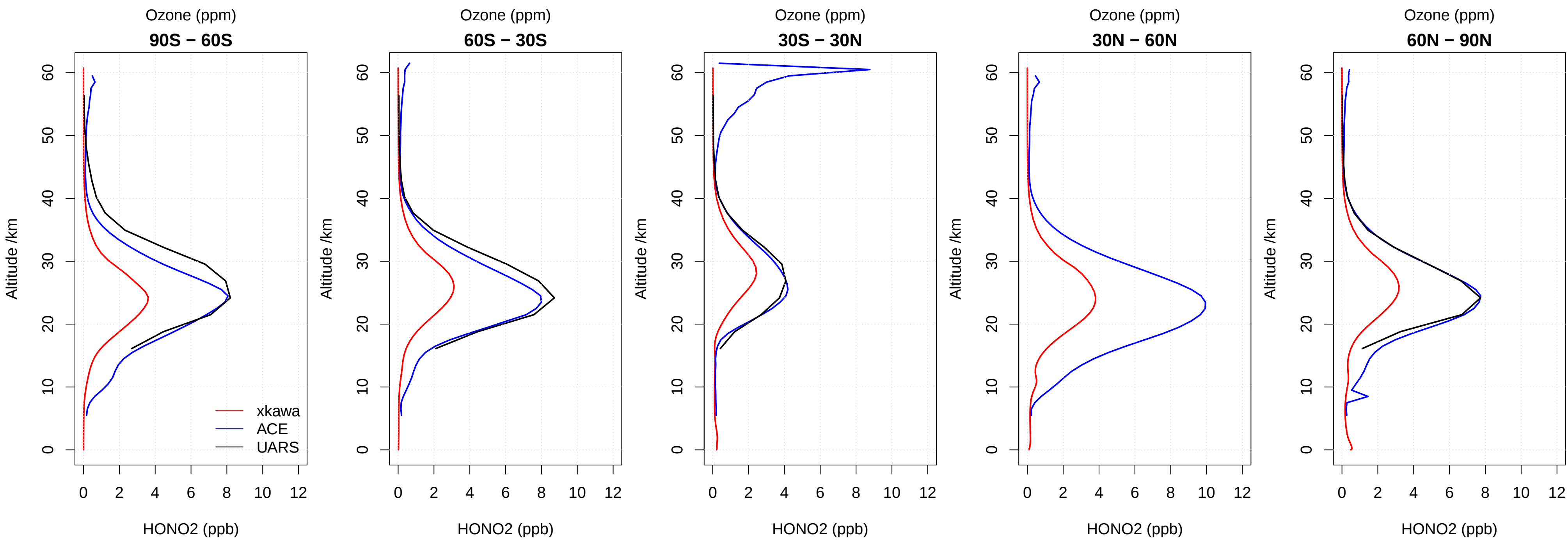
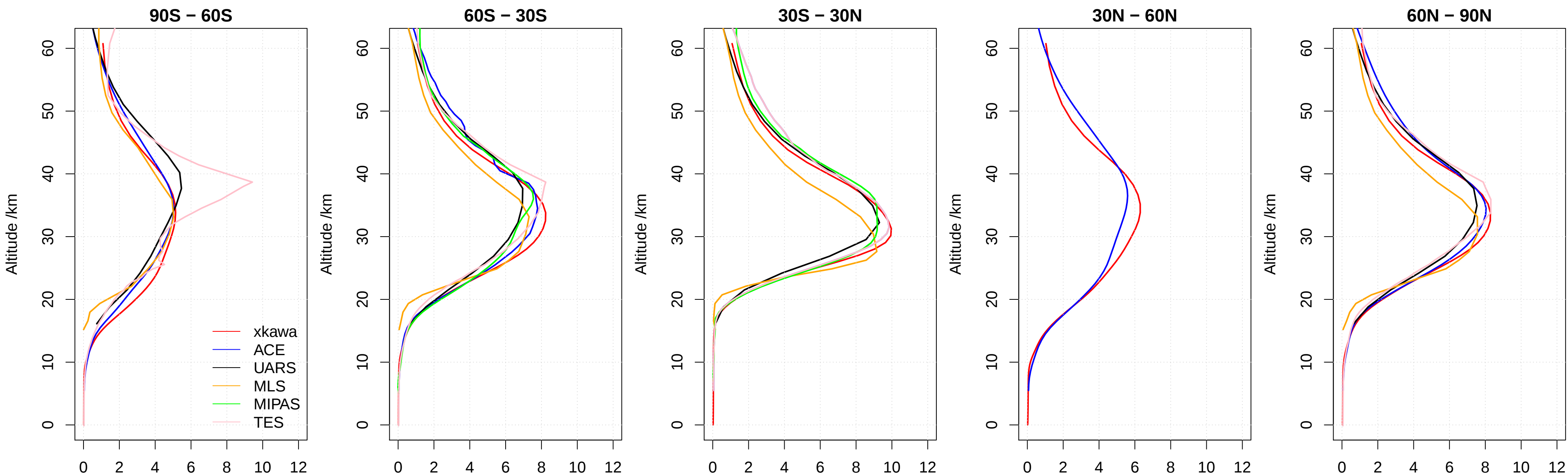
xkawa Loss of Tropospheric Ox

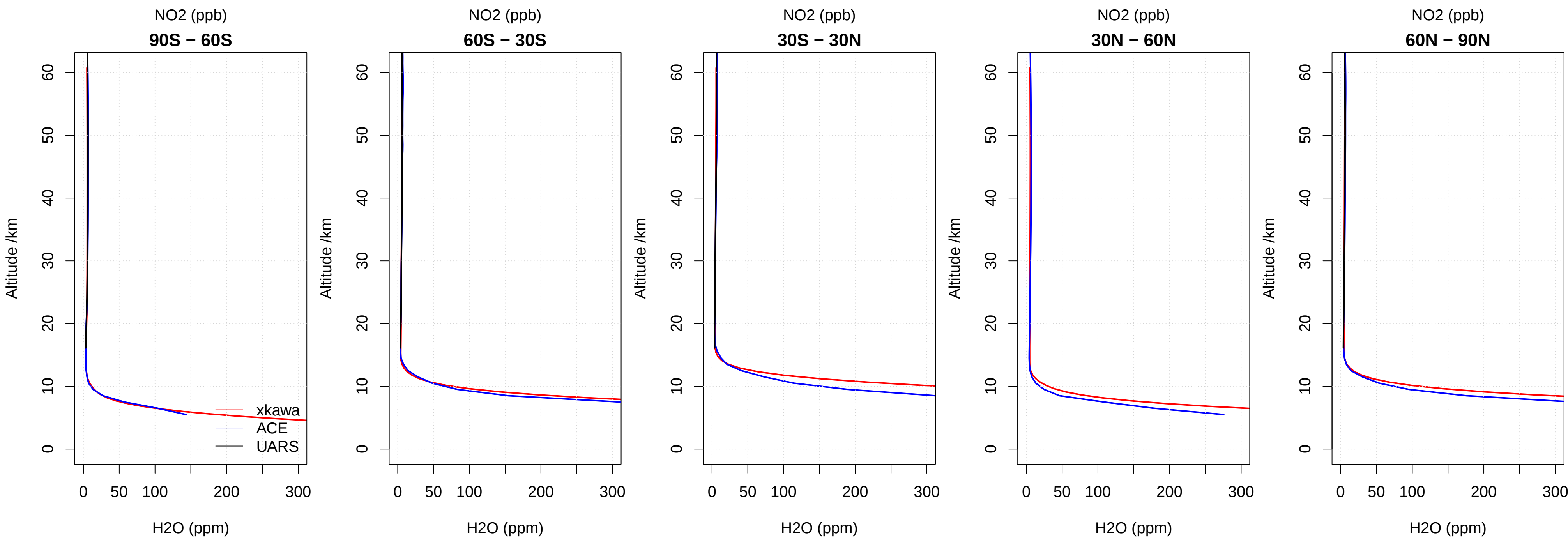
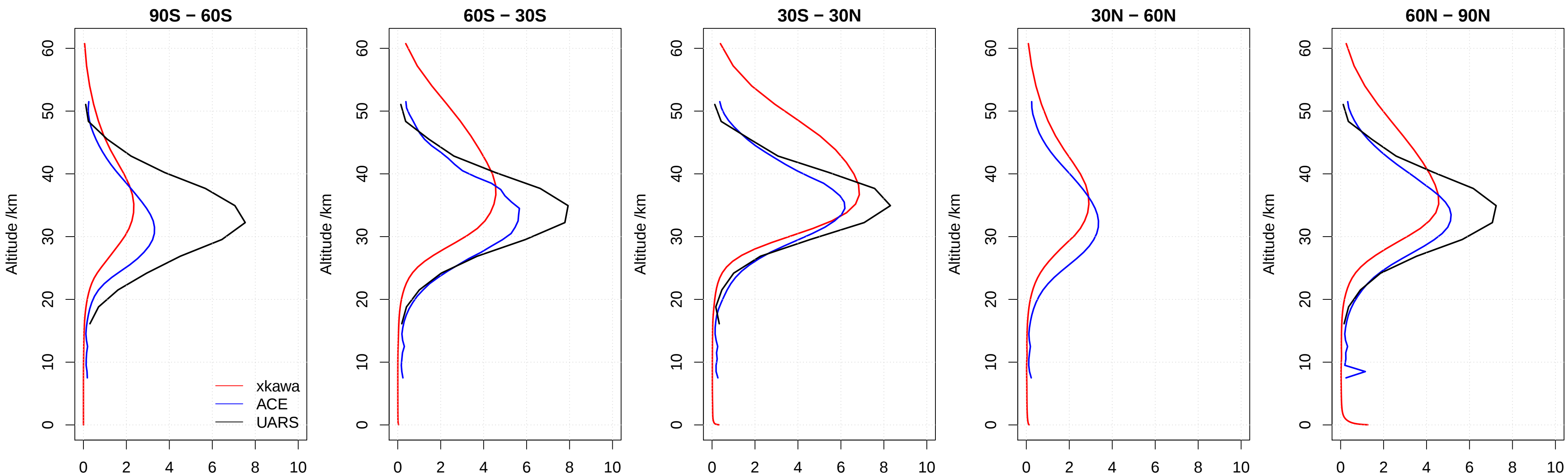


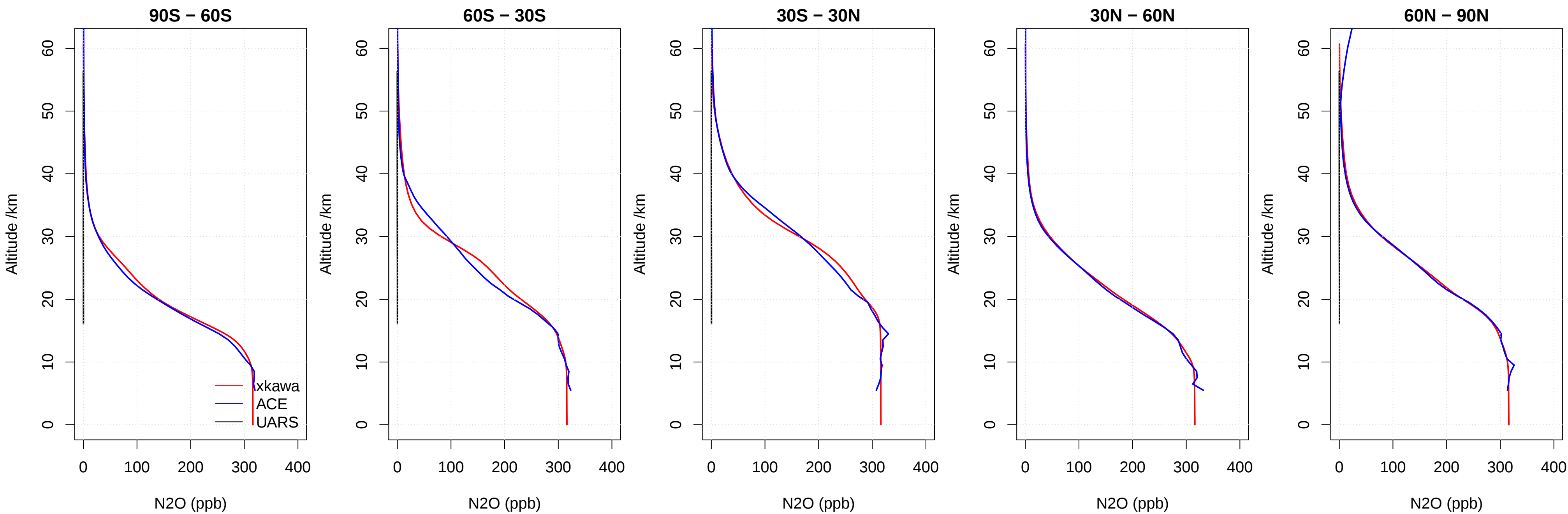
UKCA Ox deposition xkawa

Total Ox Deposition = 940 Tg/yr



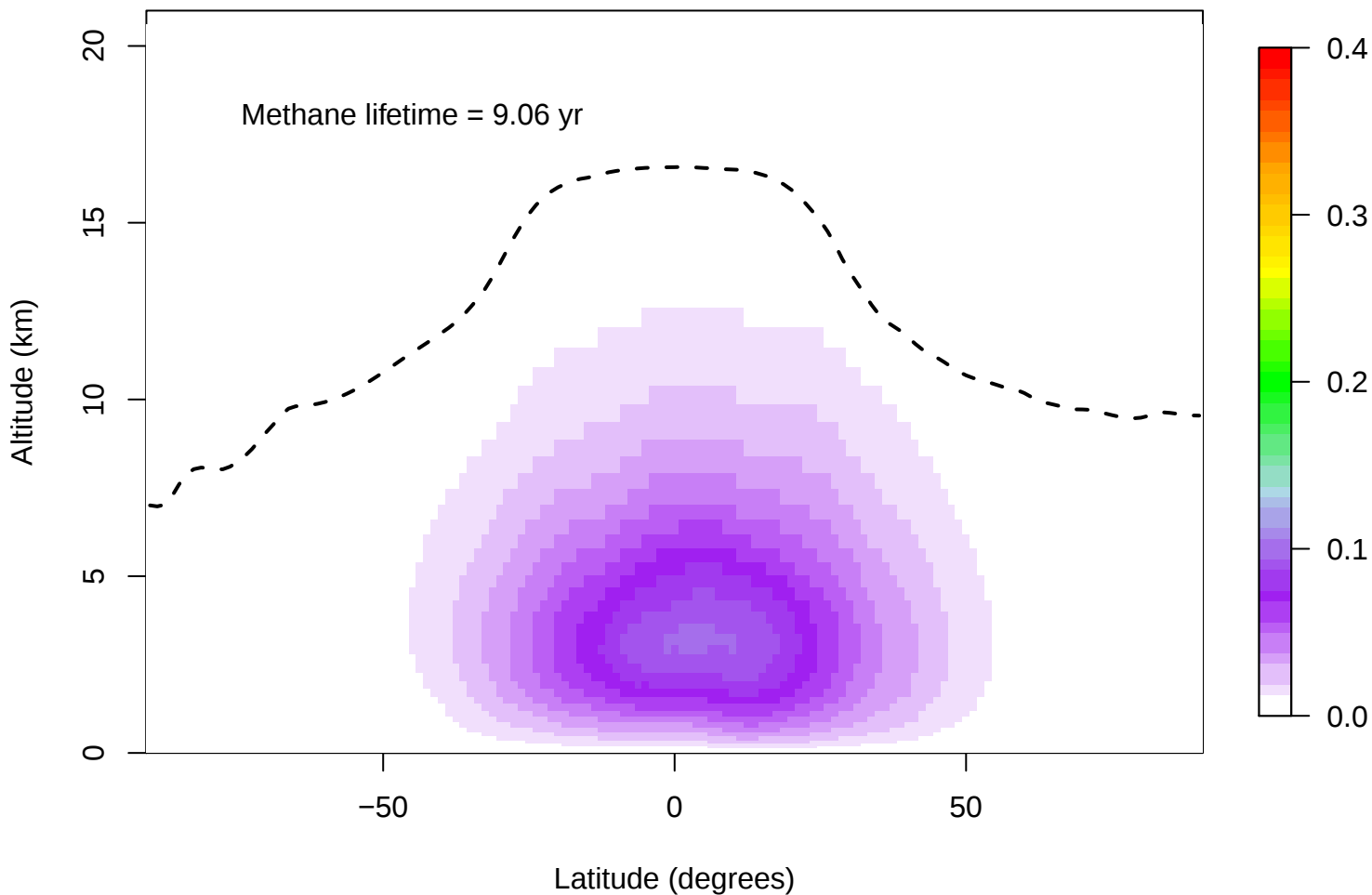




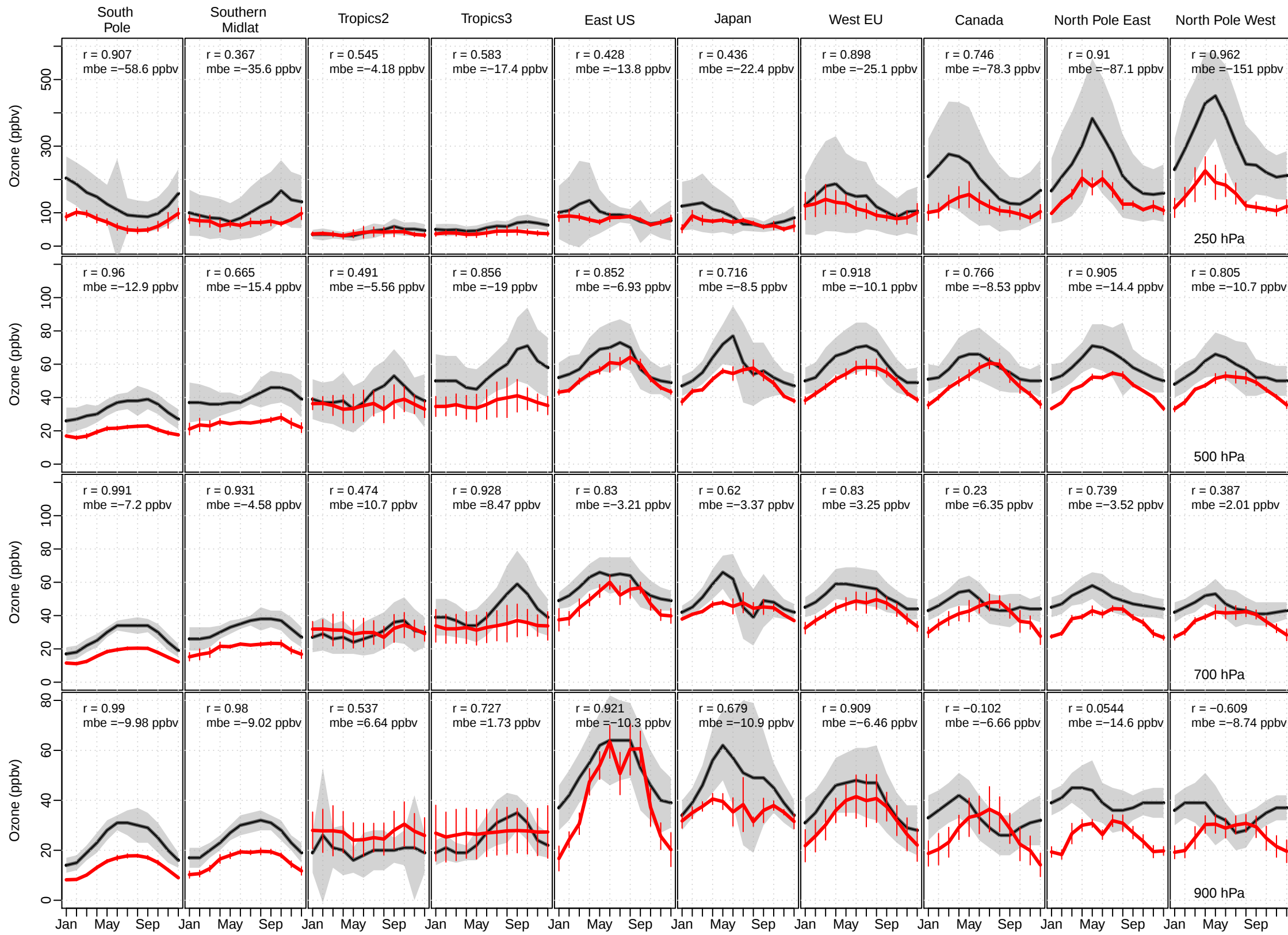


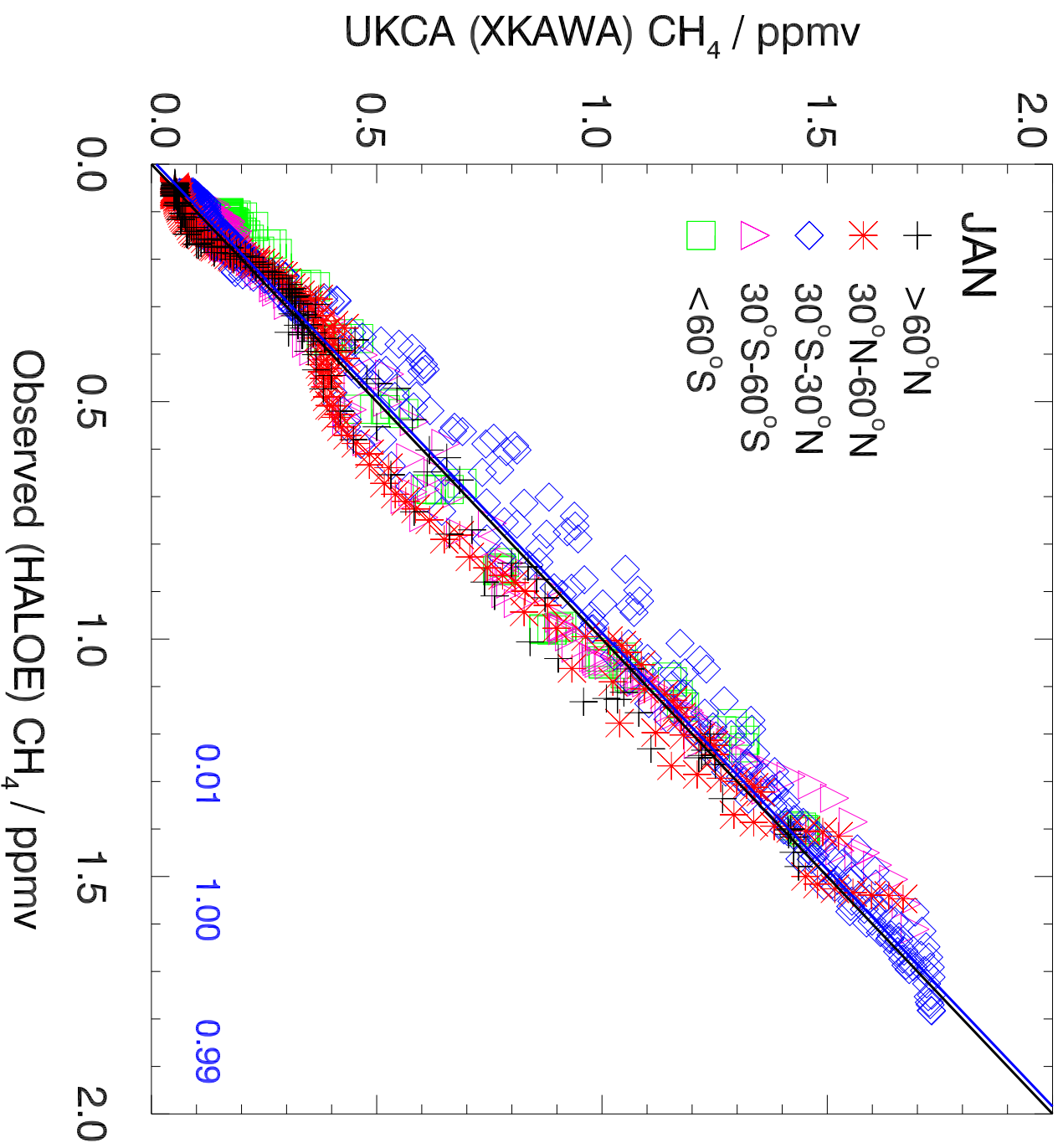
UKCA xkawa

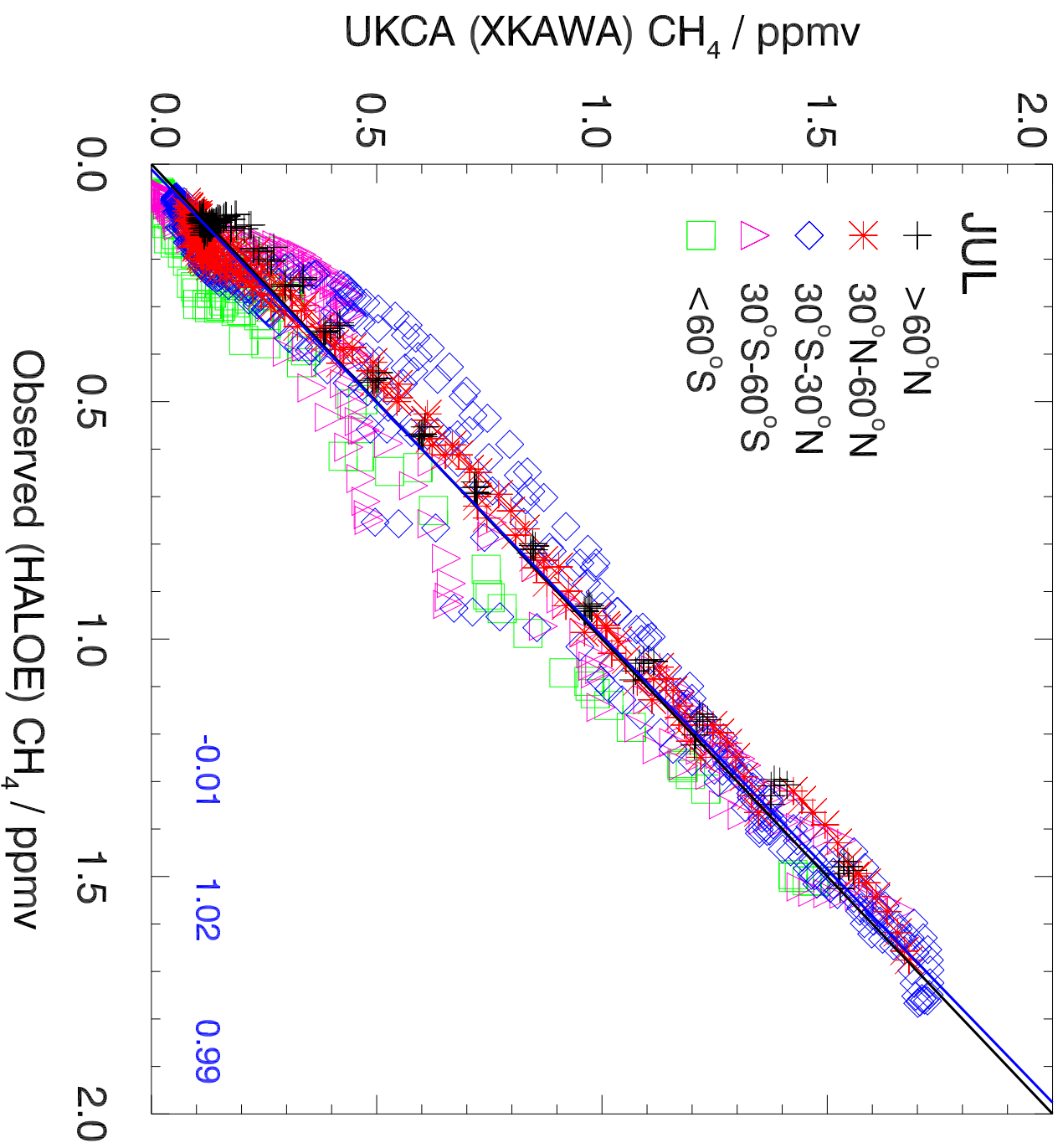
% CH₄ + OH flux (moles cm⁻³ s⁻¹)

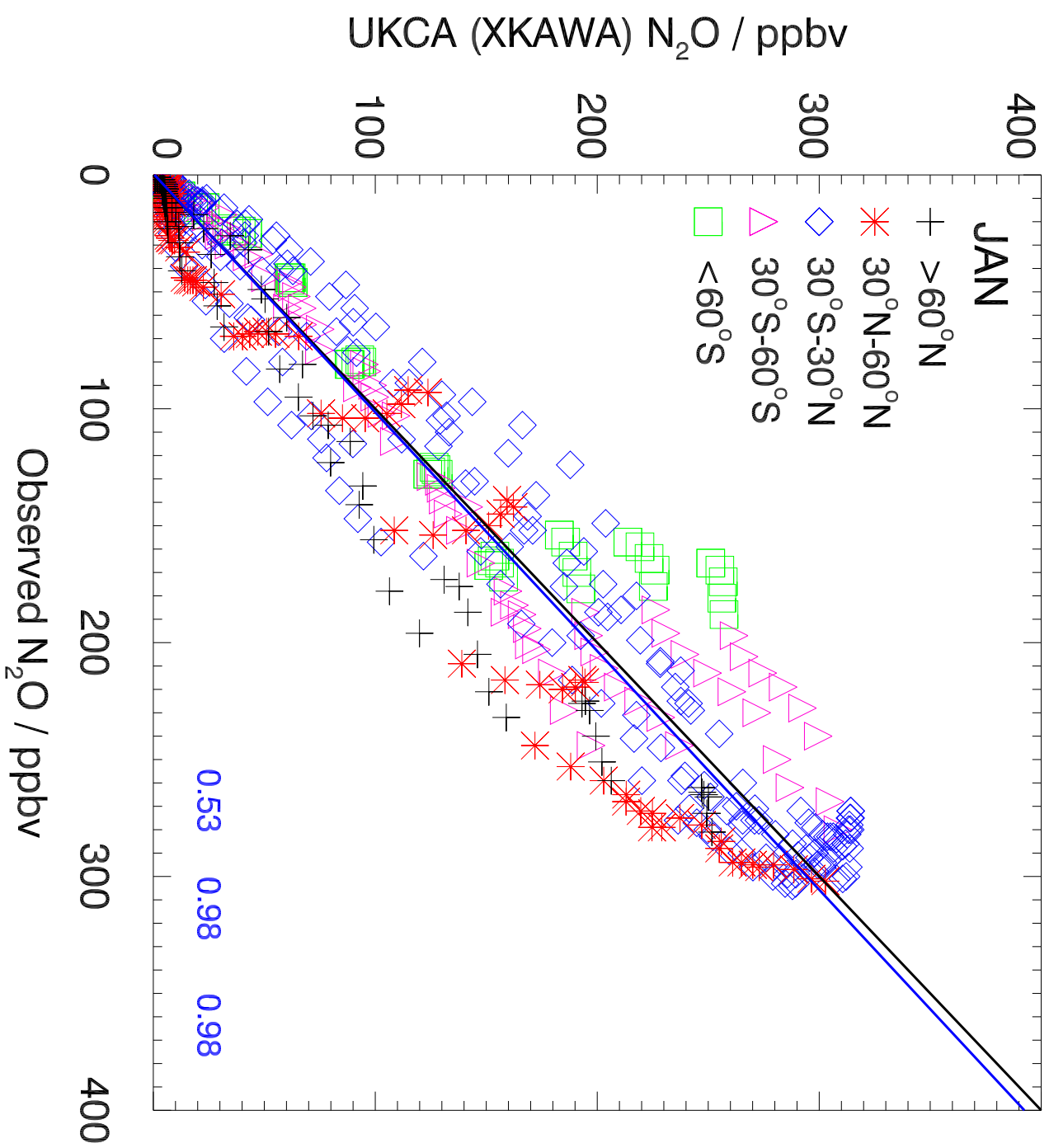


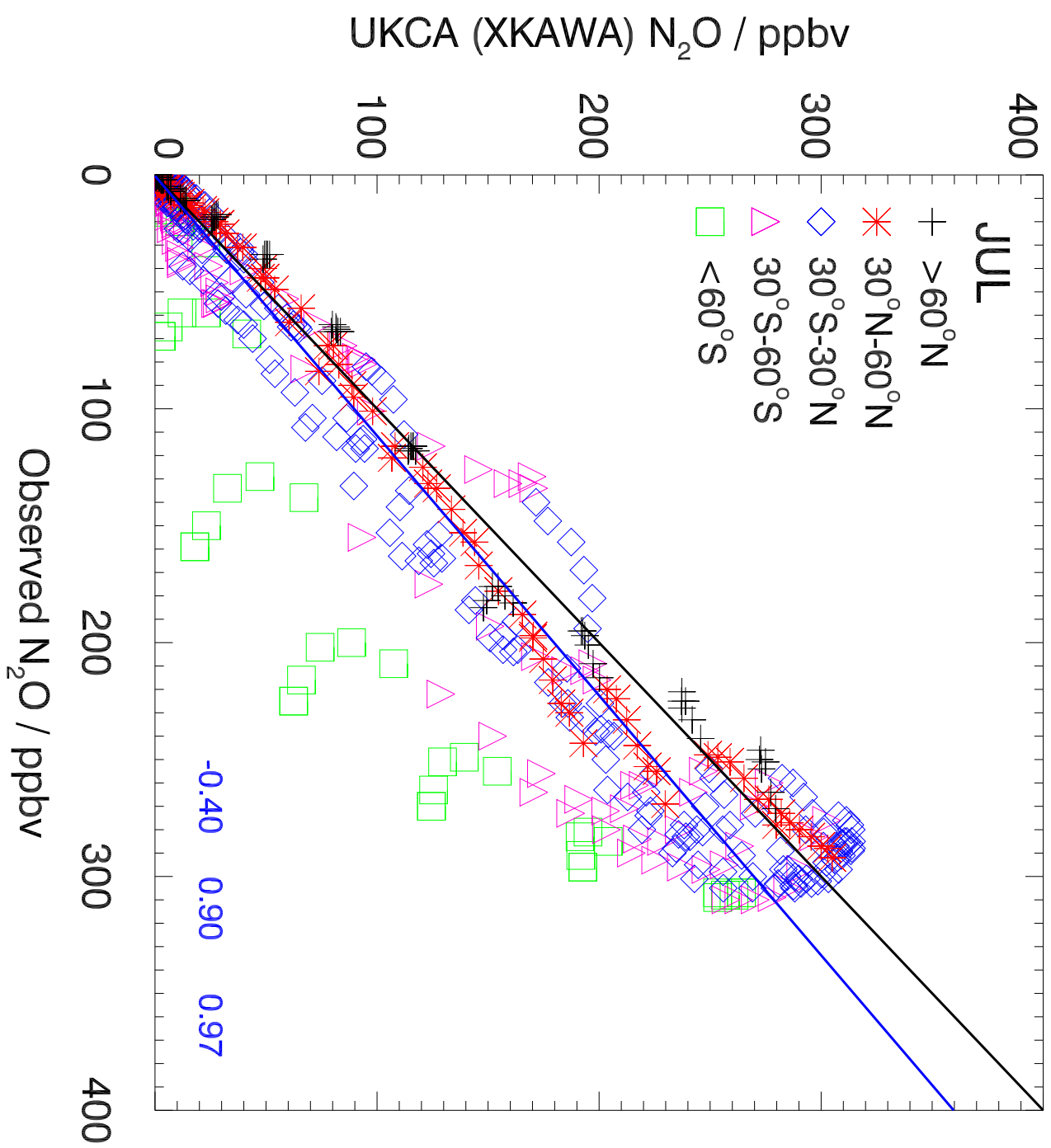
xkawa Tilmes ozone sonde comparison

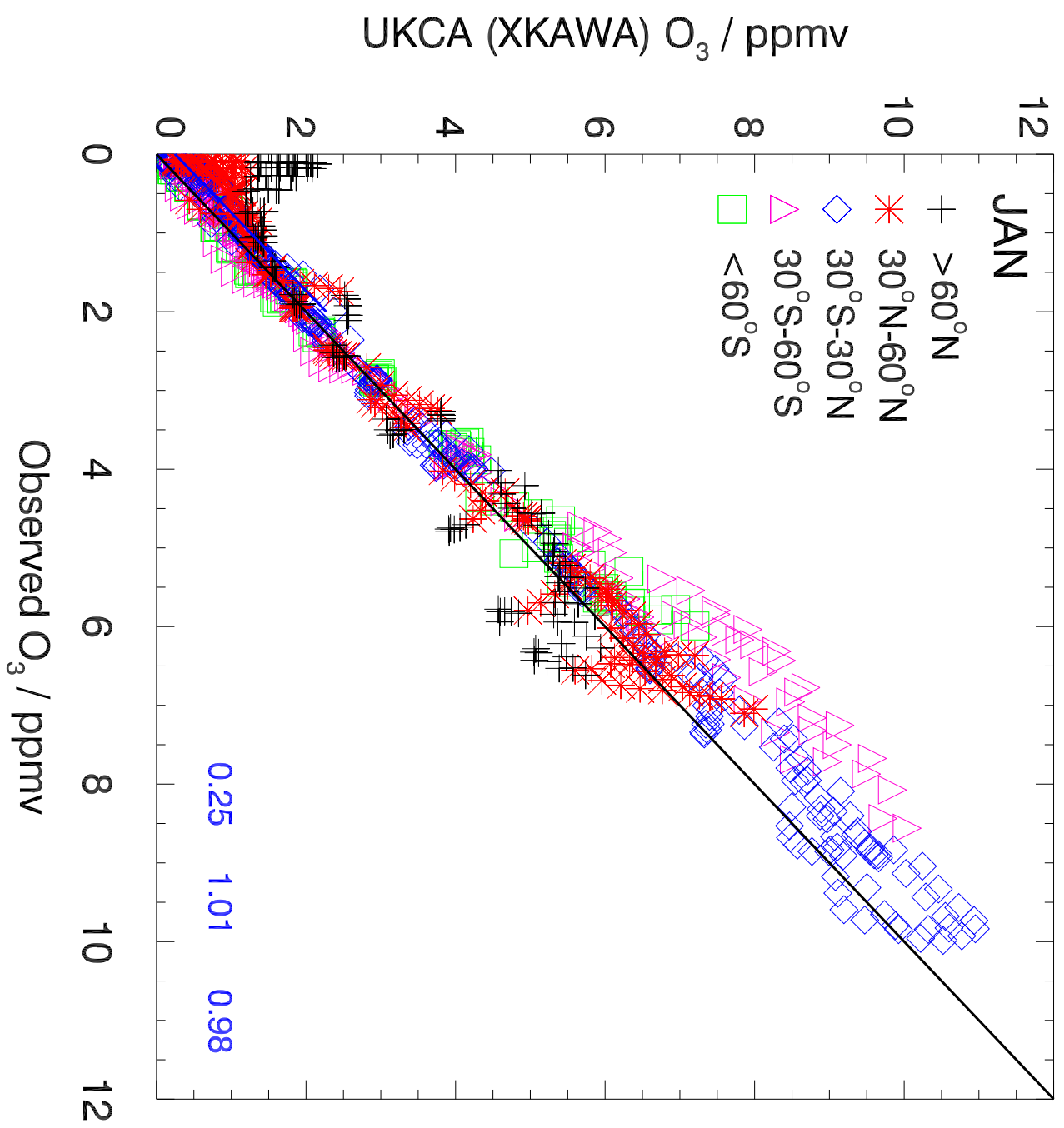


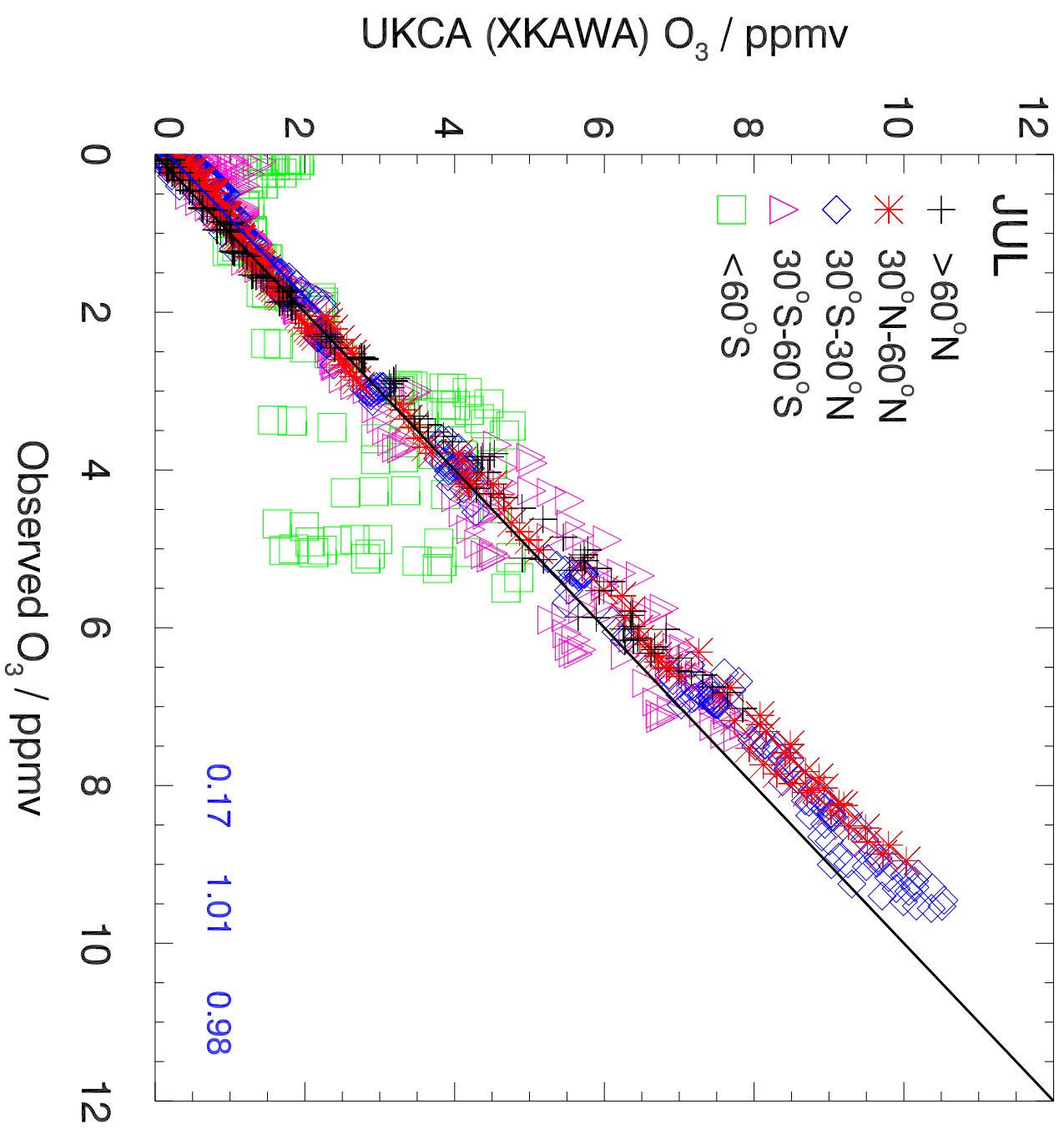


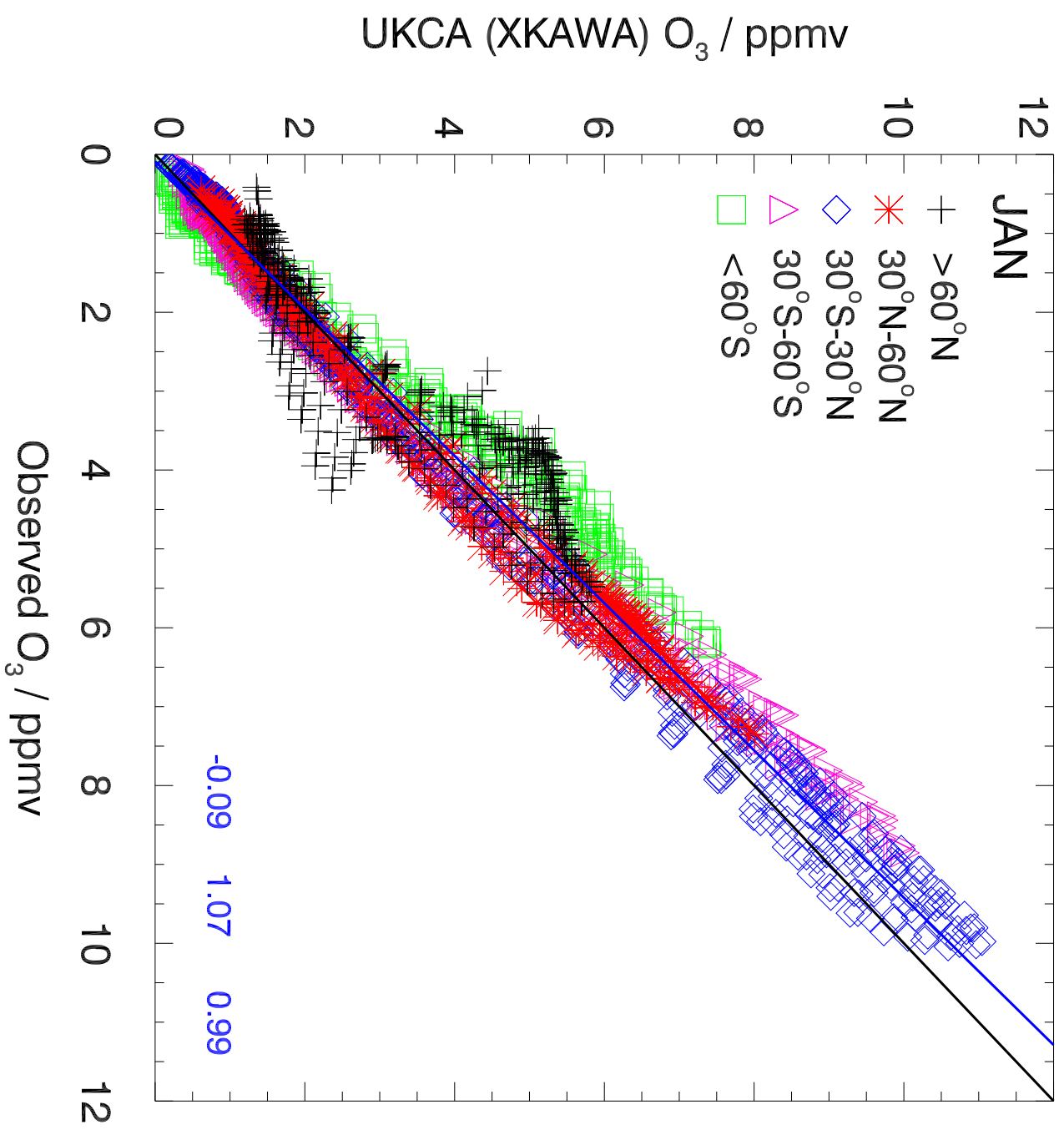


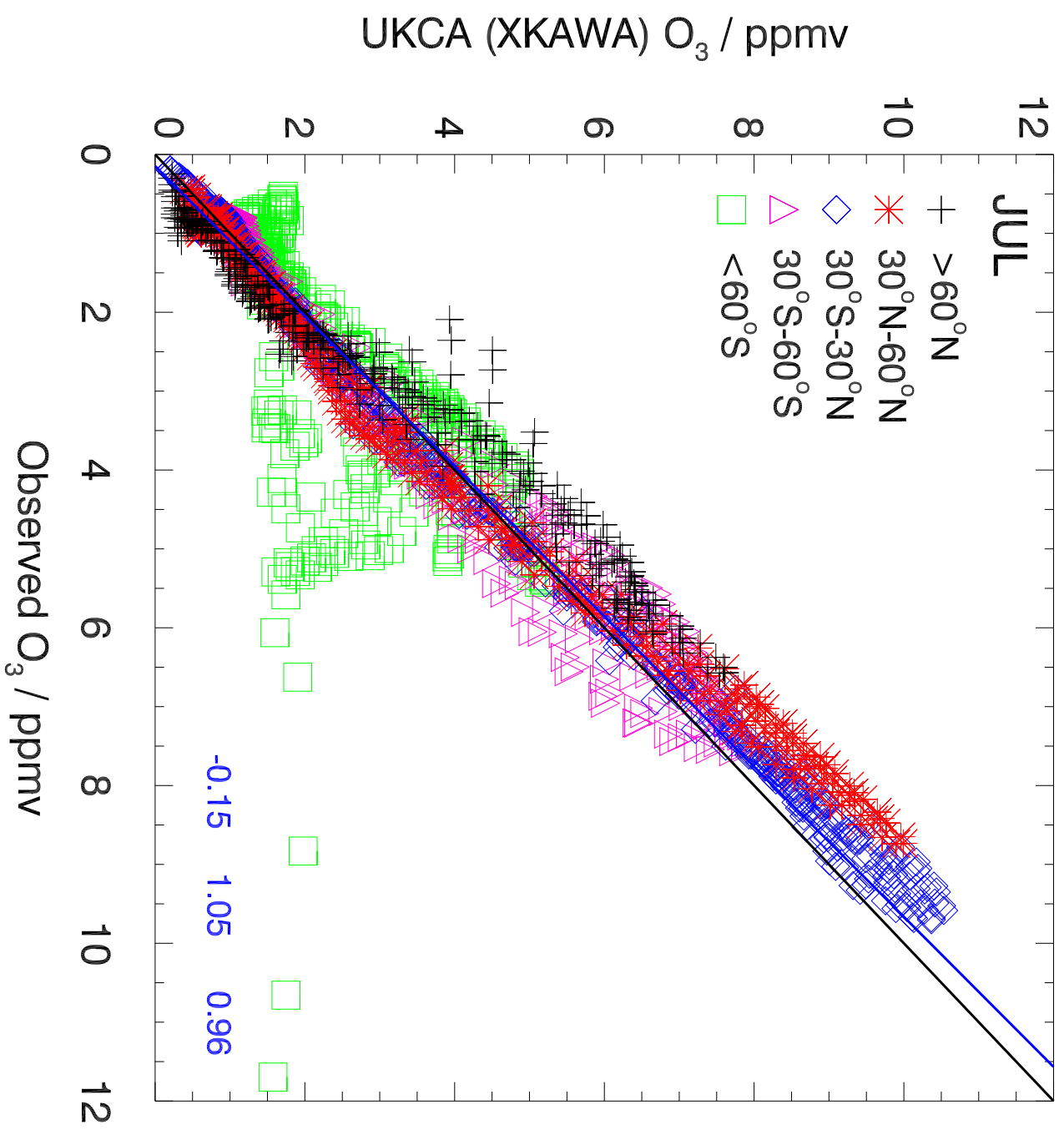




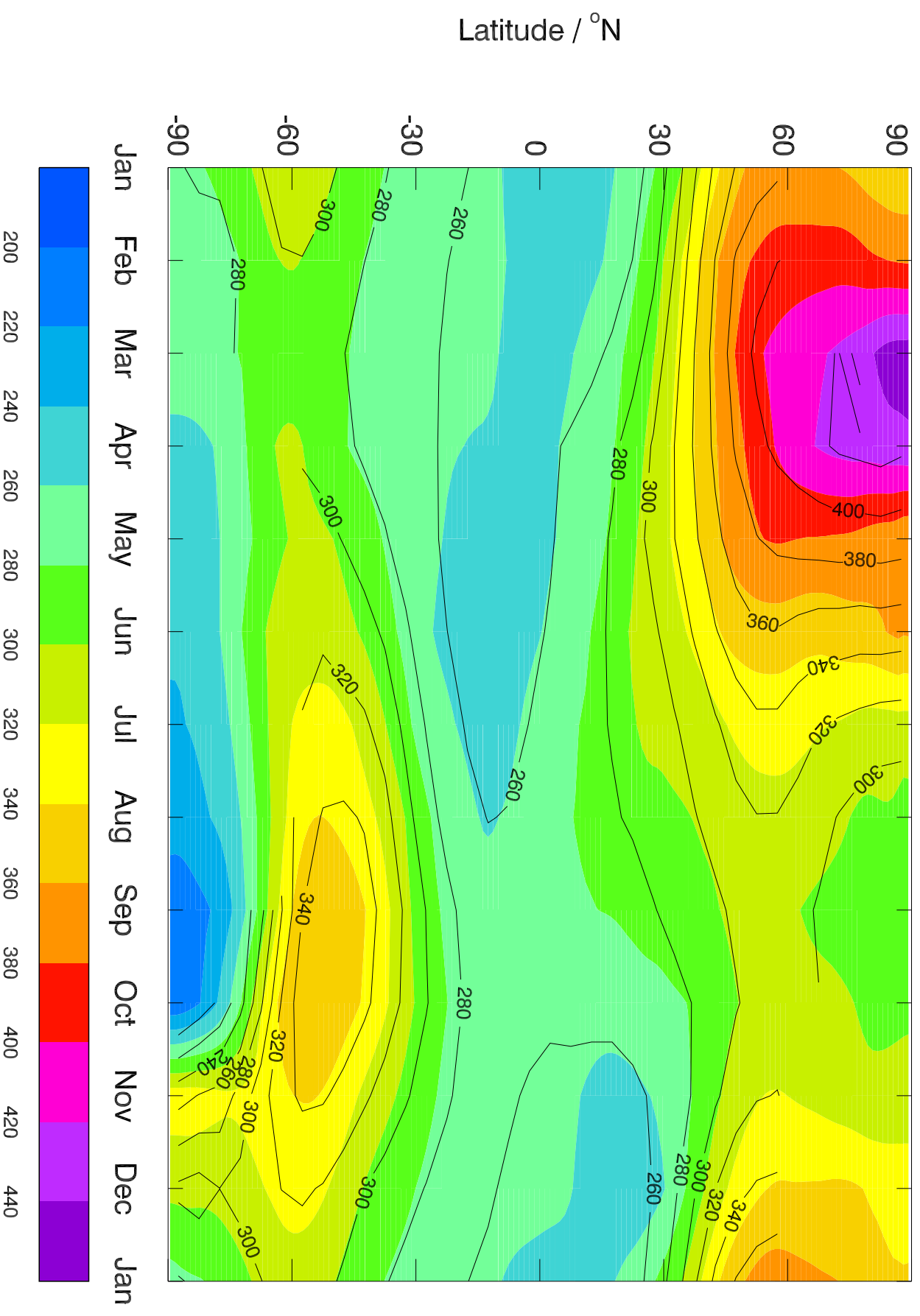




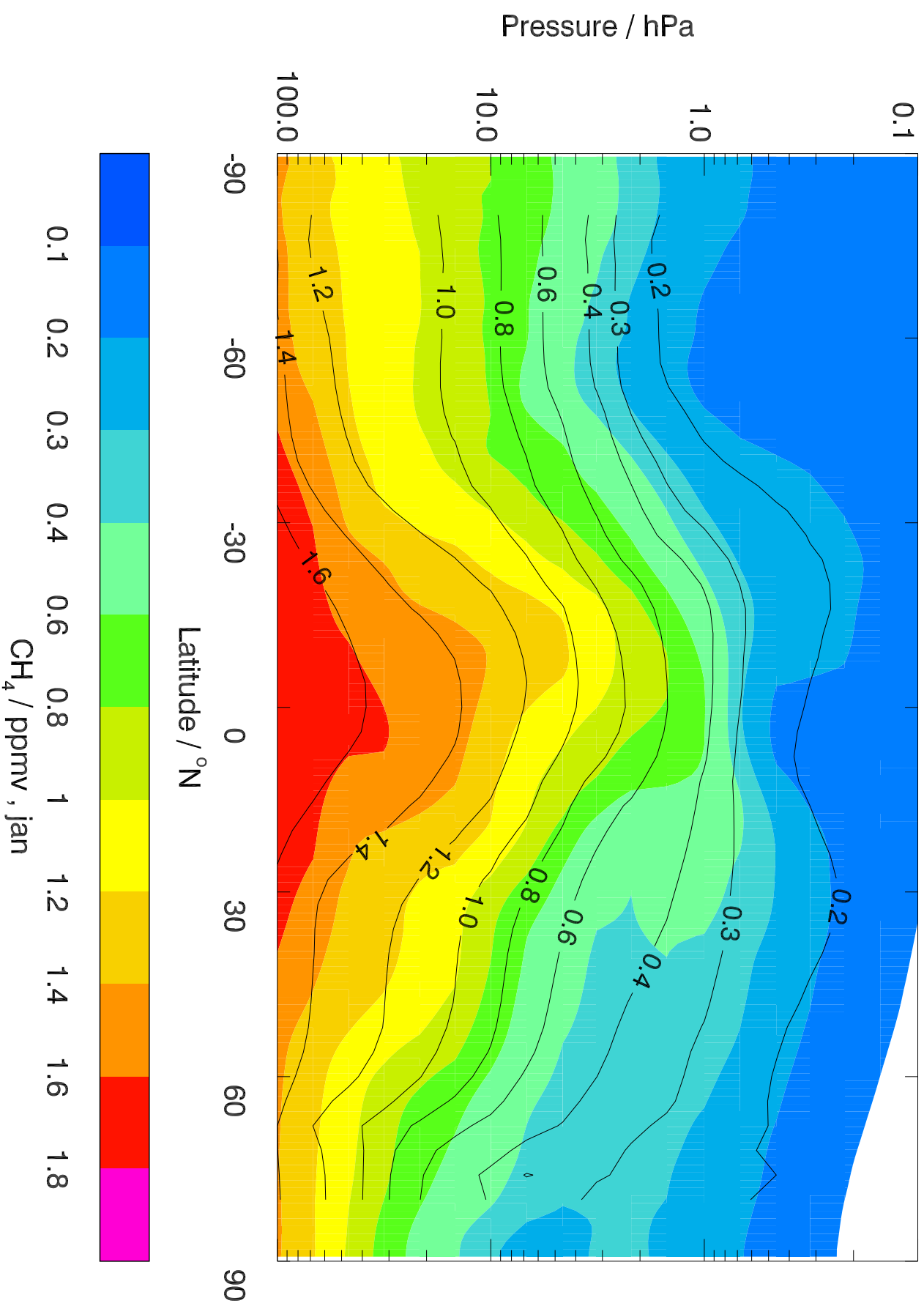




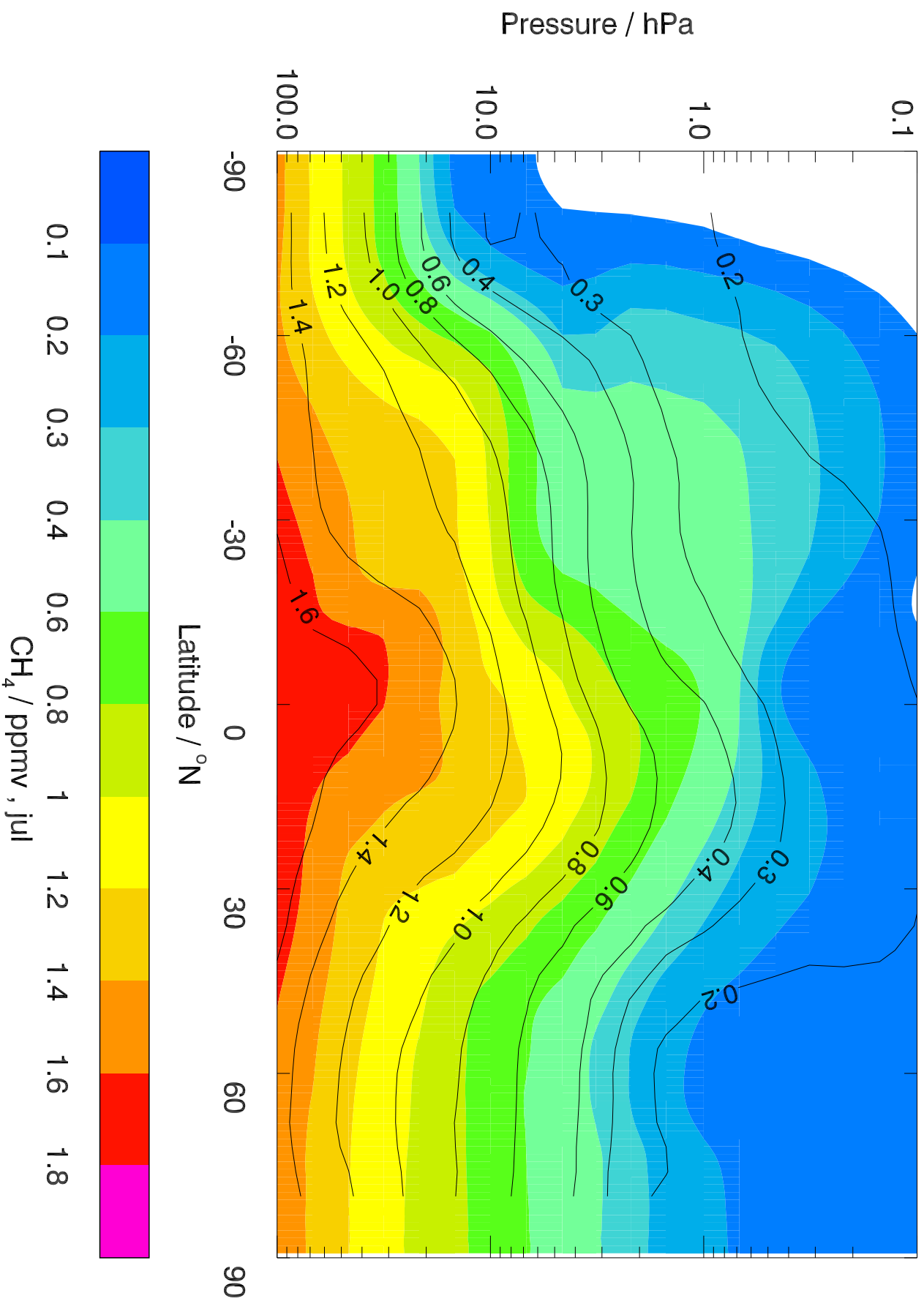
Total Ozone Column (DU). Colours: UKCA (XKAWA), Contours: TOMS



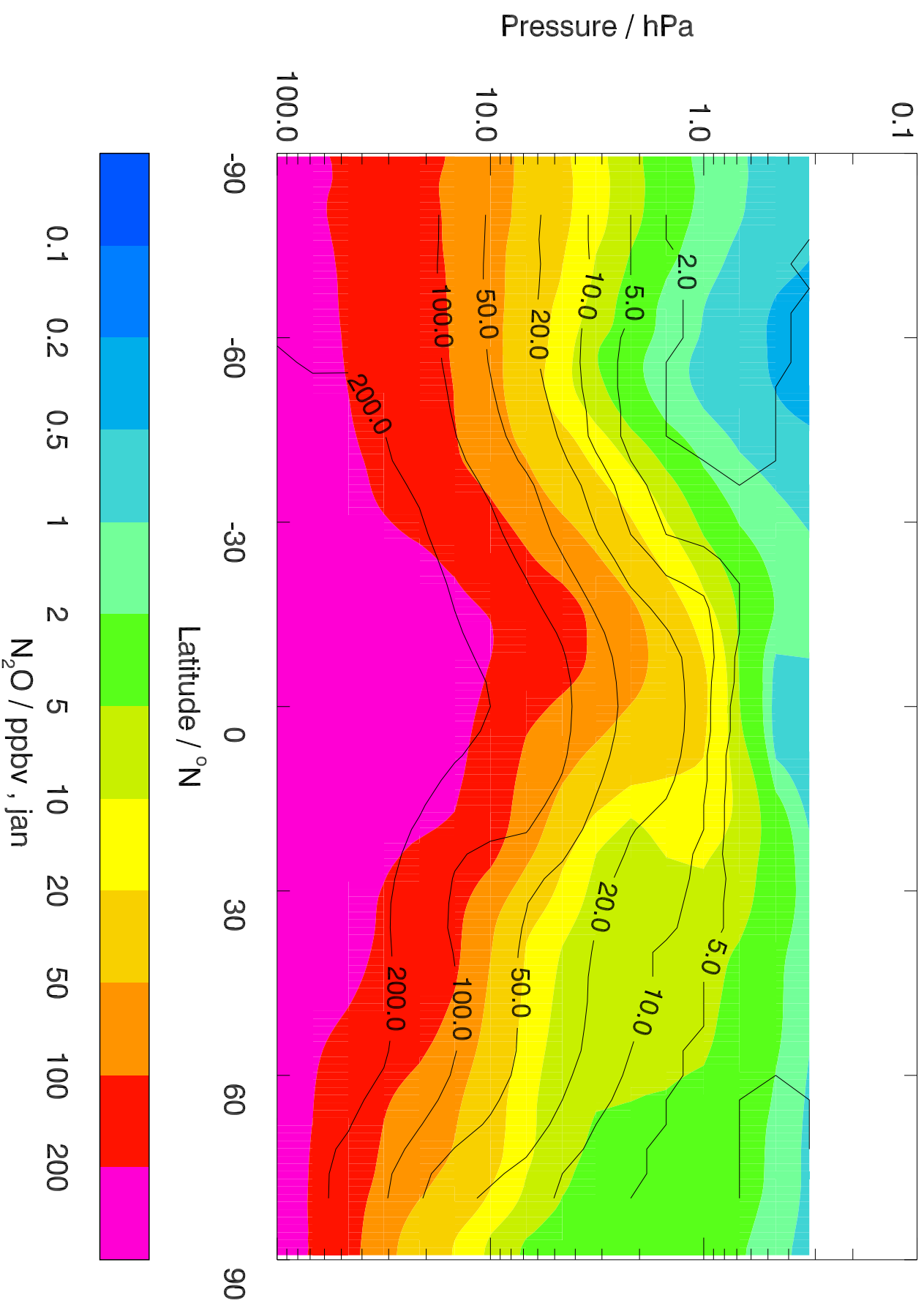
Colours: UKCA (XKAWA), Contours: HALOE



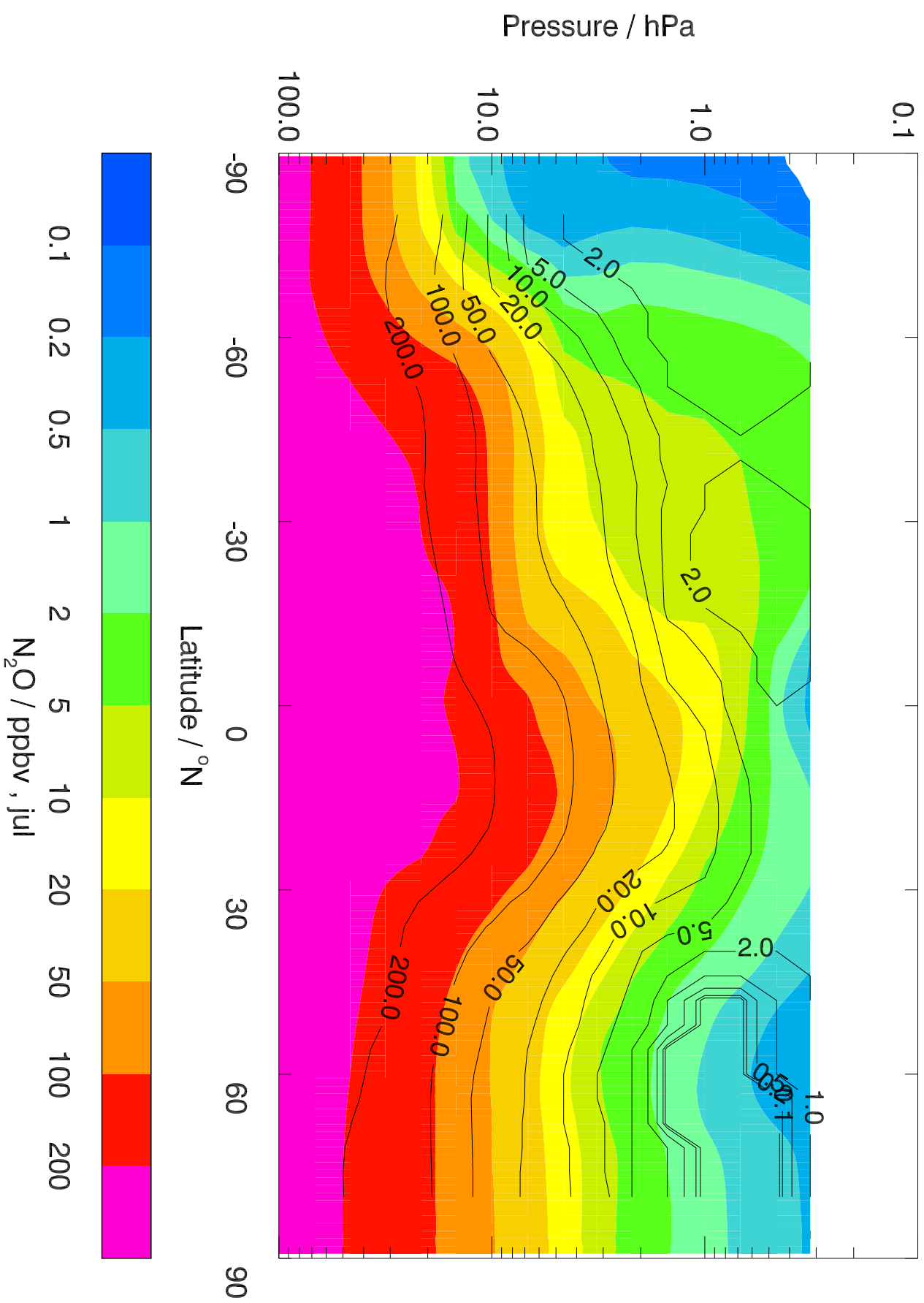
Colours: UKCA (XKAWA), Contours: HALOE



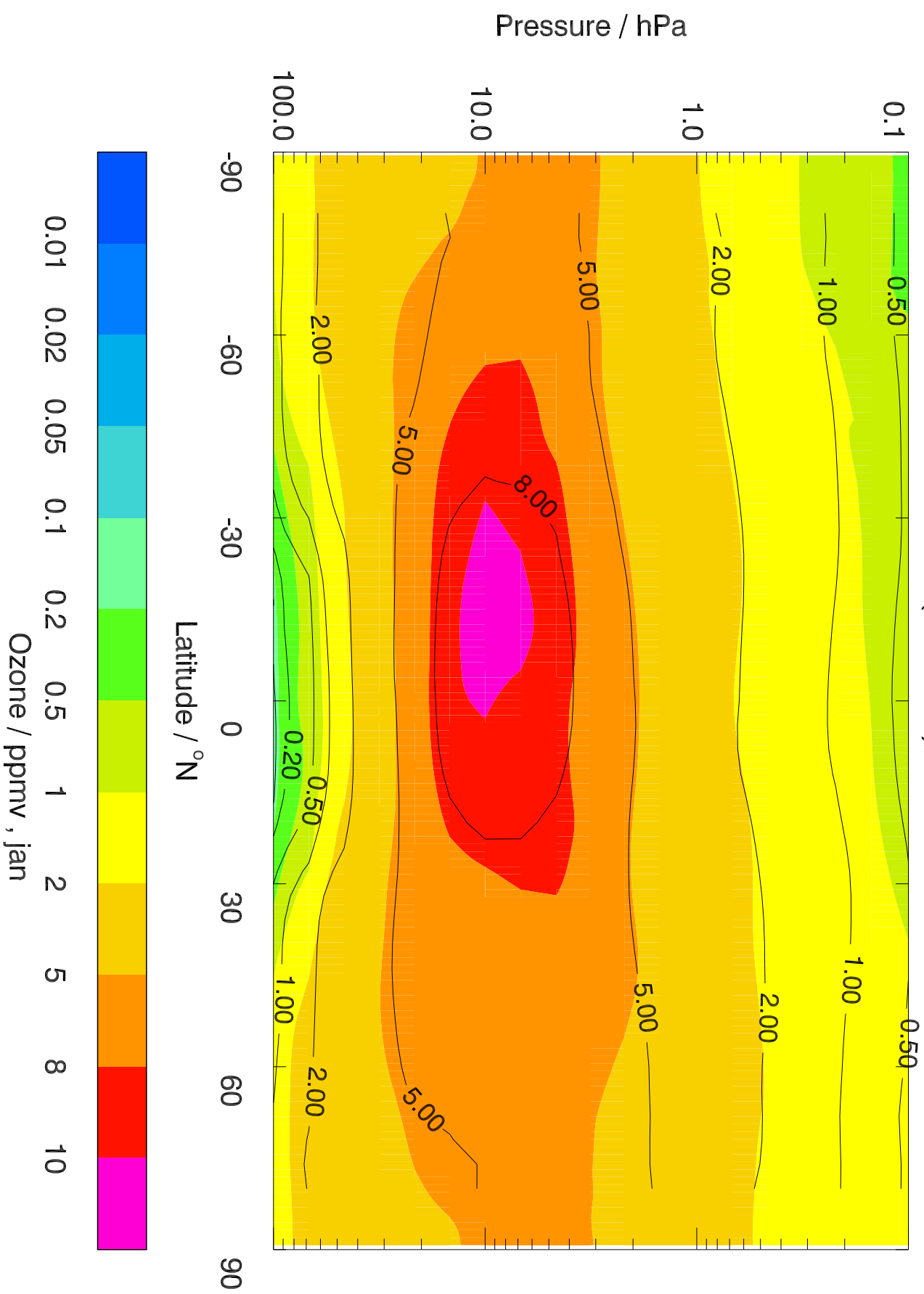
Colours: UKCA (XKAWA), Contours: HALOE



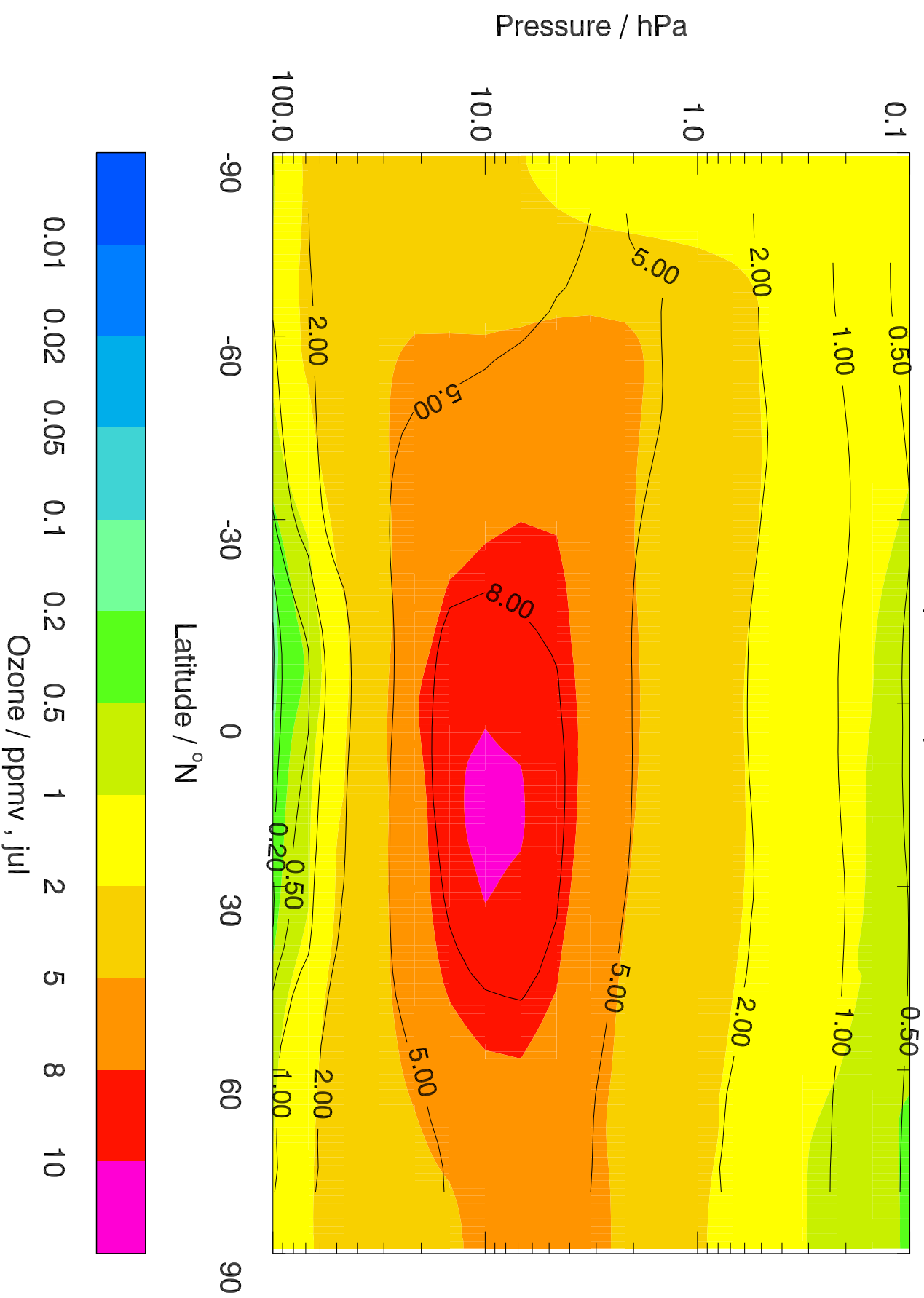
Colours: UKCA (XKAWA), Contours: HALOE



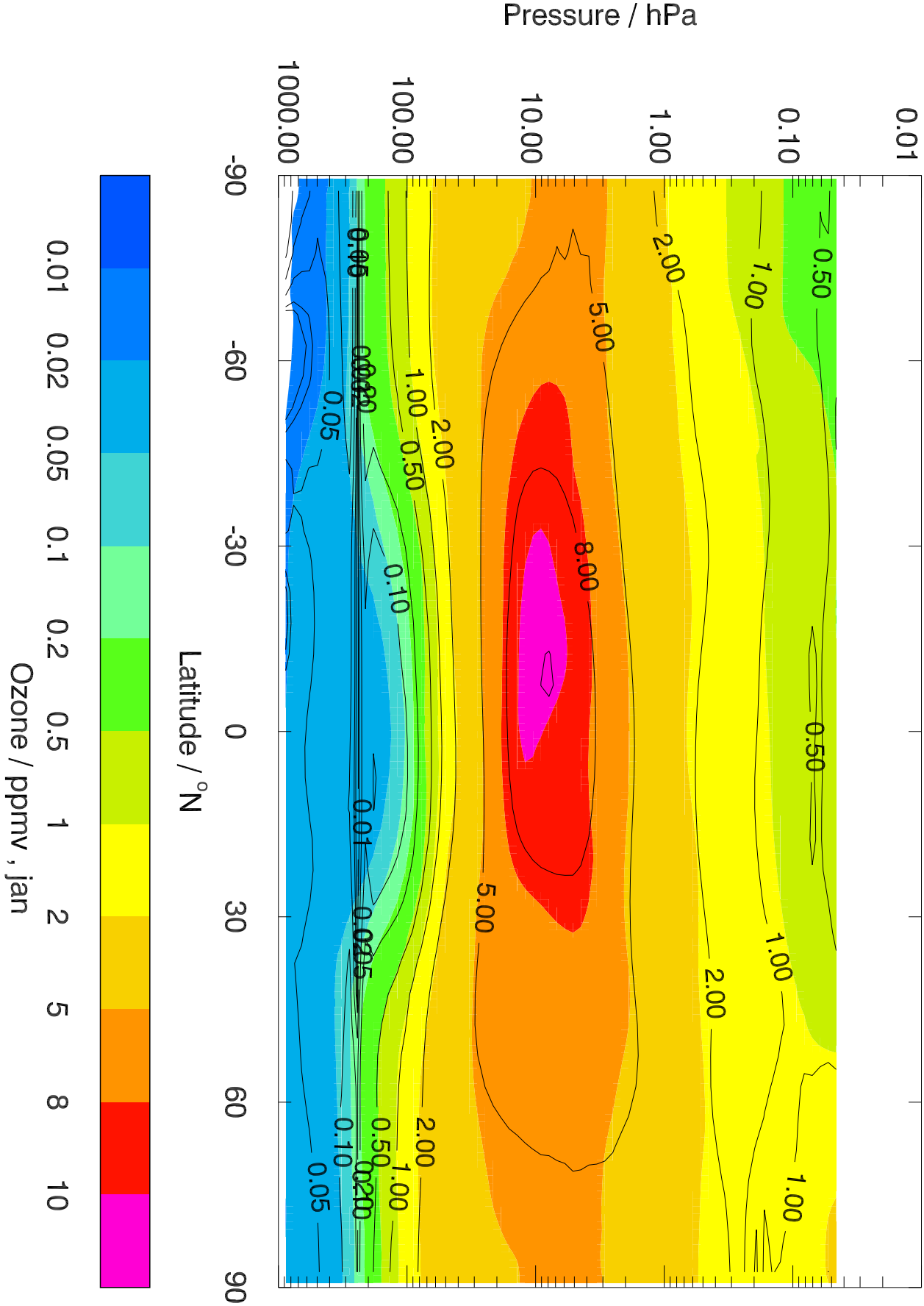
Colours: UKCA (XKAWA), Contours: HALOE



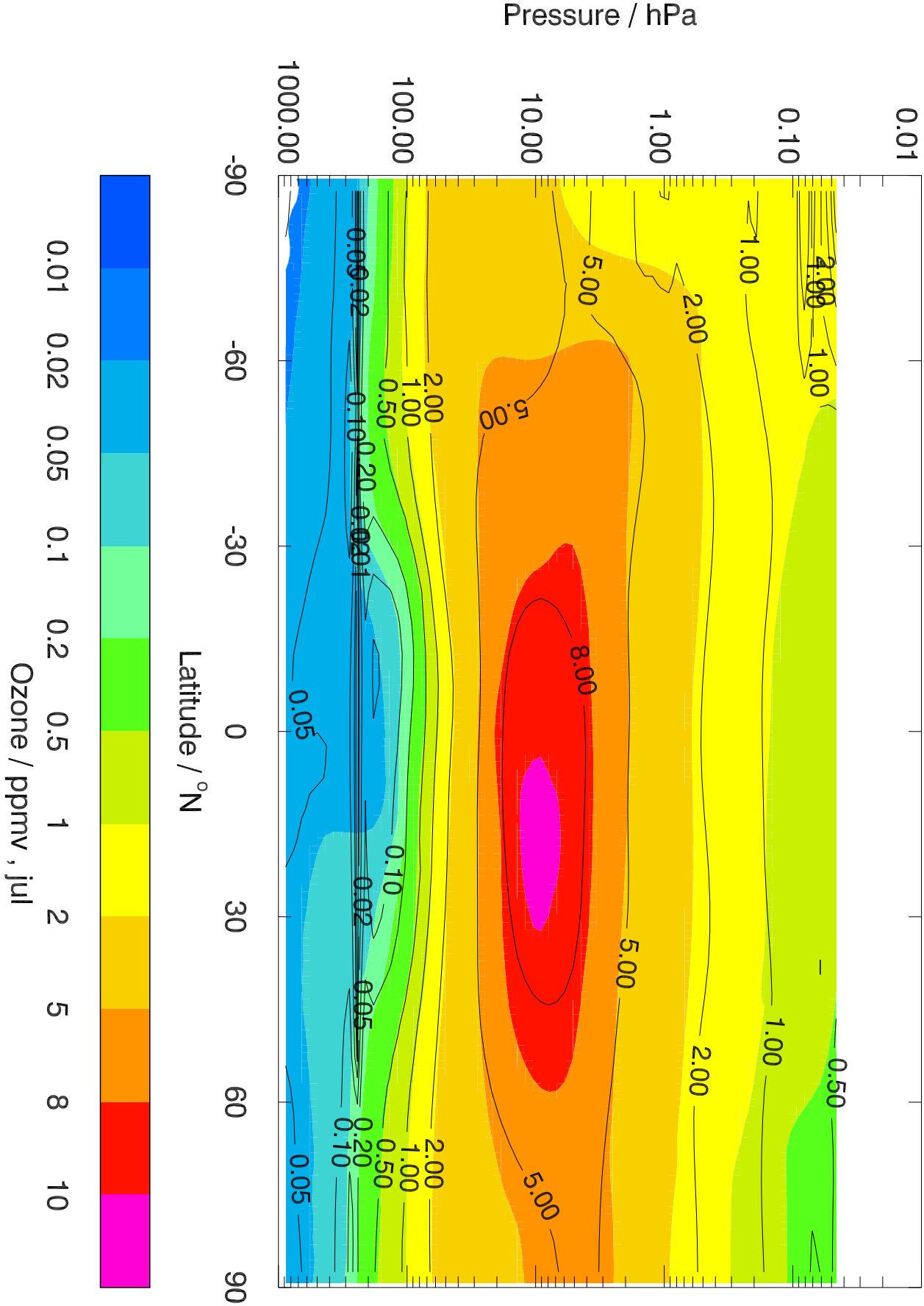
Colours: UKCA (XKAWA), Contours: HALOE

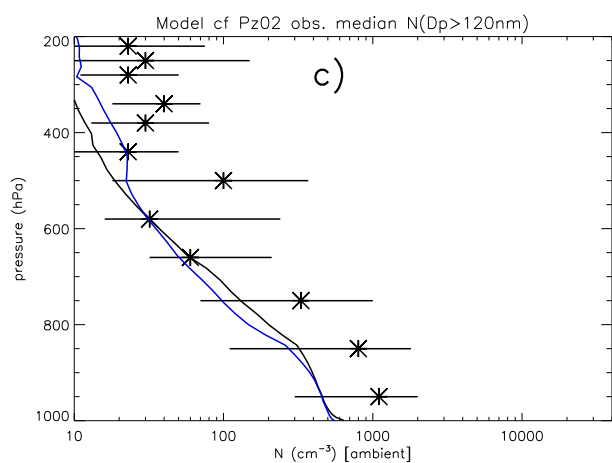
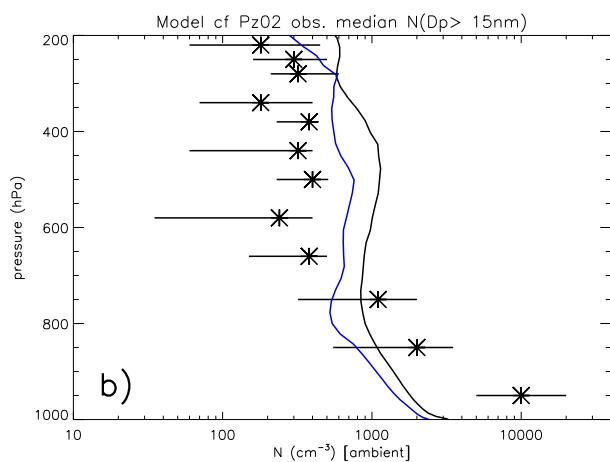
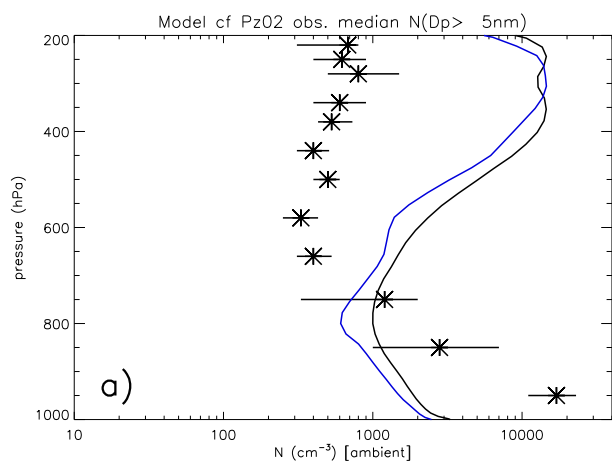


Colours: UKCA (XKAWA), Contours: NIWA-CCMVal

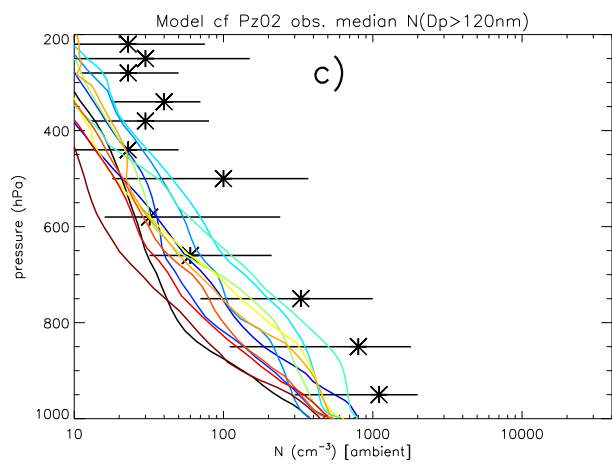
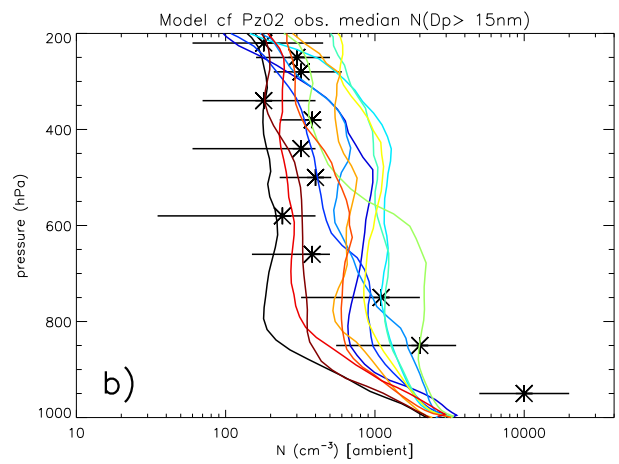
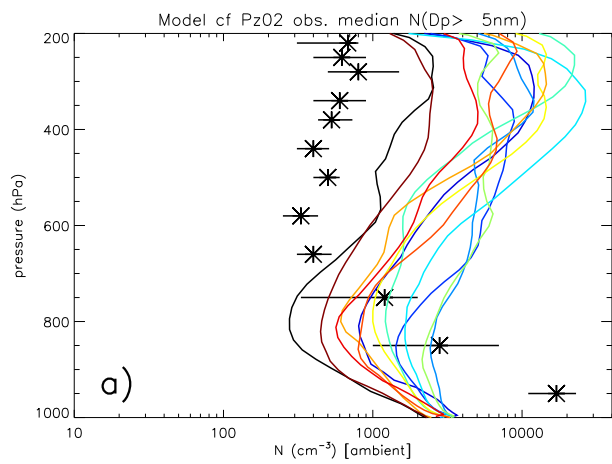


Colours: UKCA (XKAWA), Contours: NIWA-CCMVal

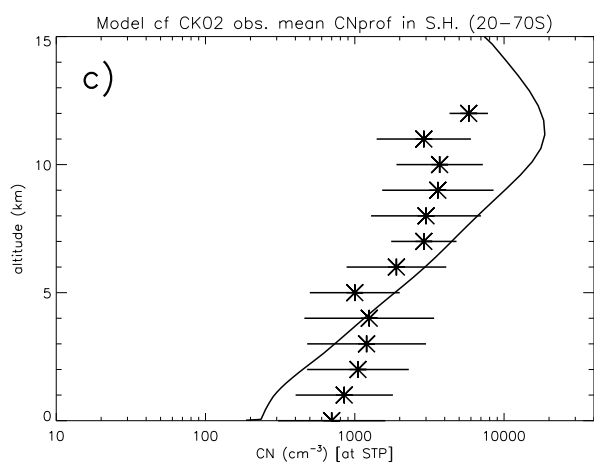
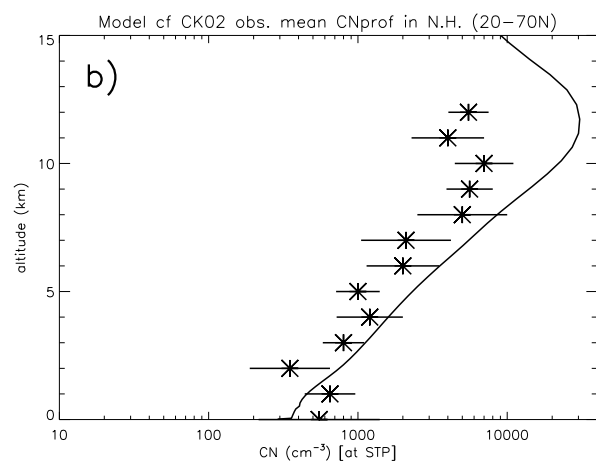
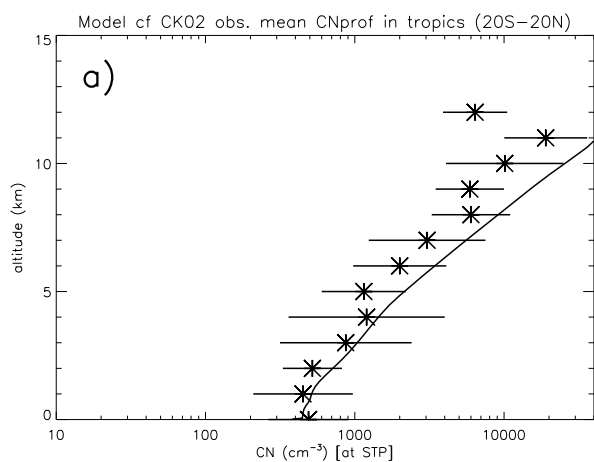




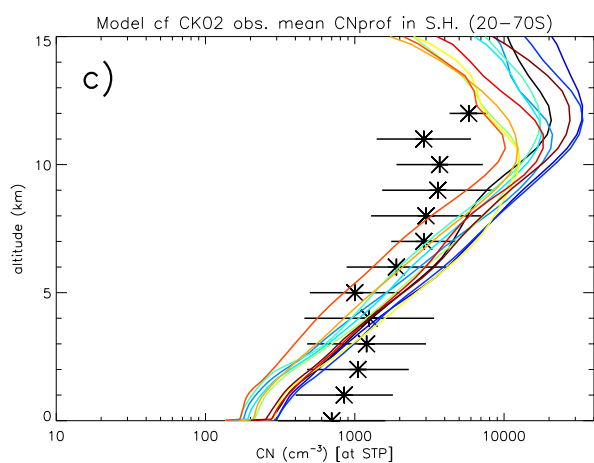
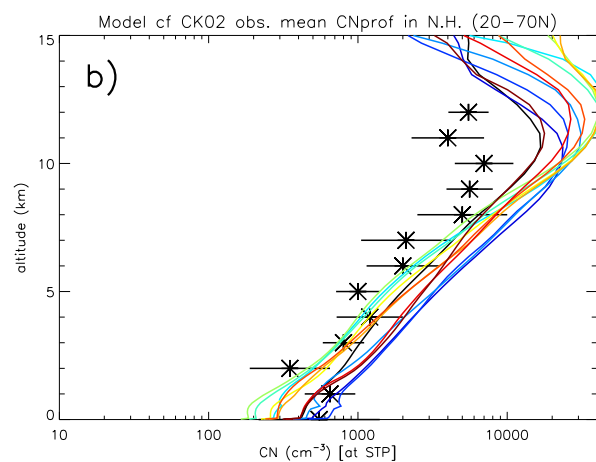
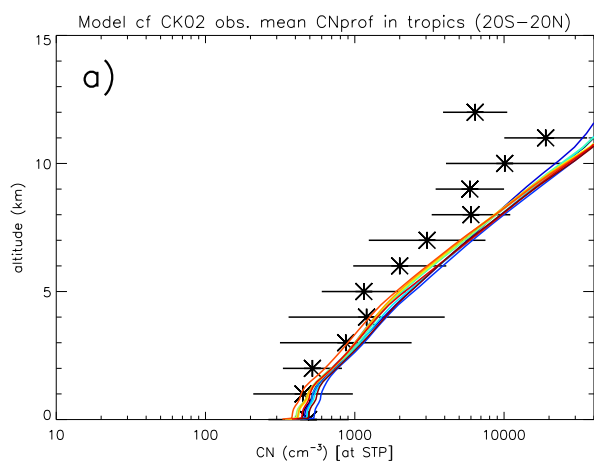
HadGEM3UKCA_XKAWA_2009



HadGEM3UKCA_XKAWA_2009

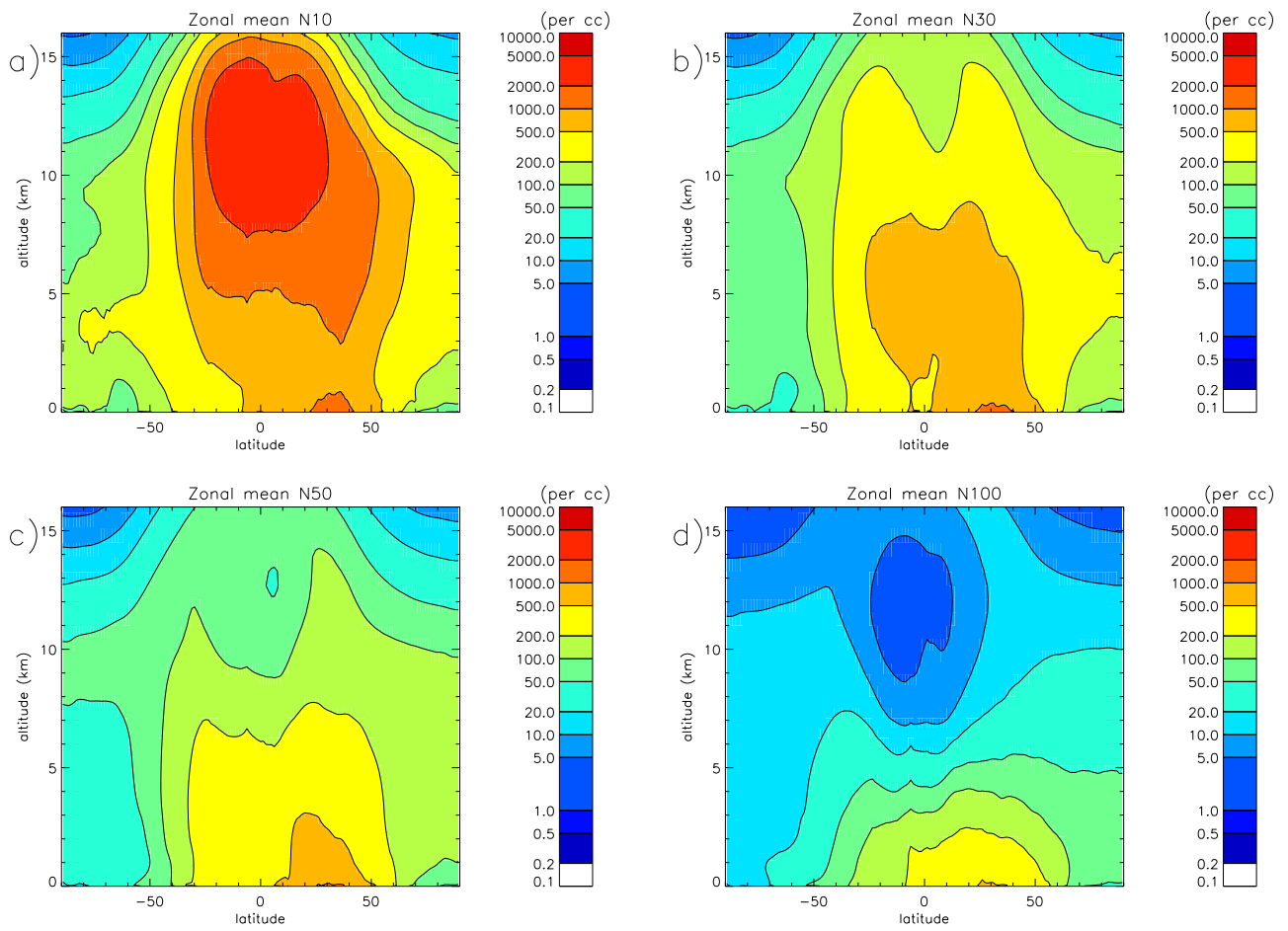


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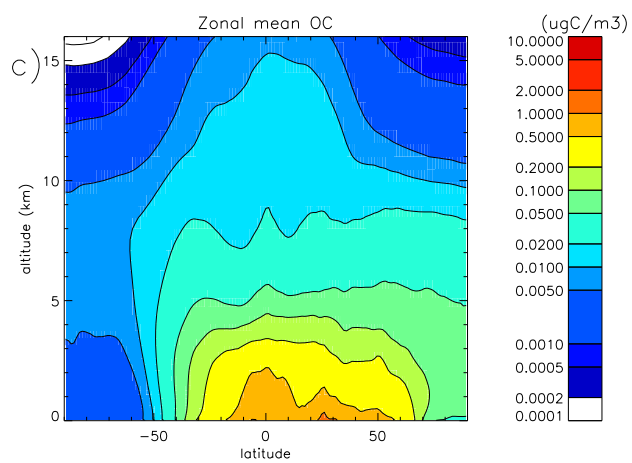
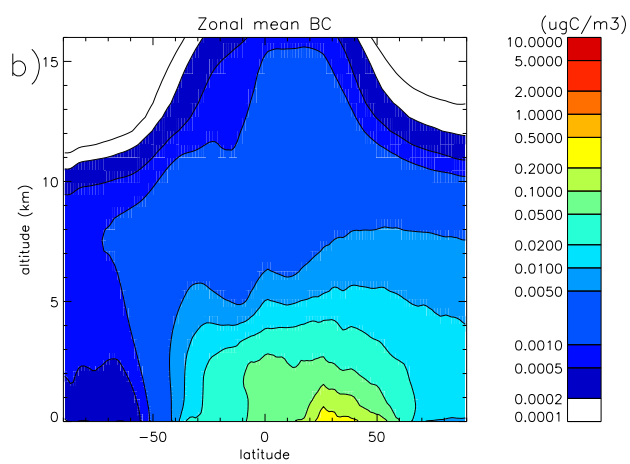
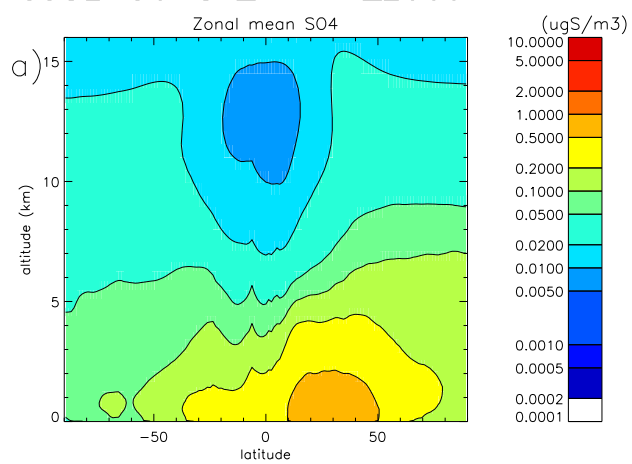


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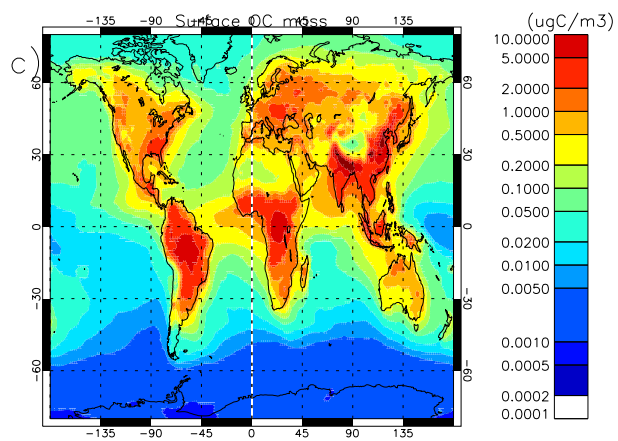
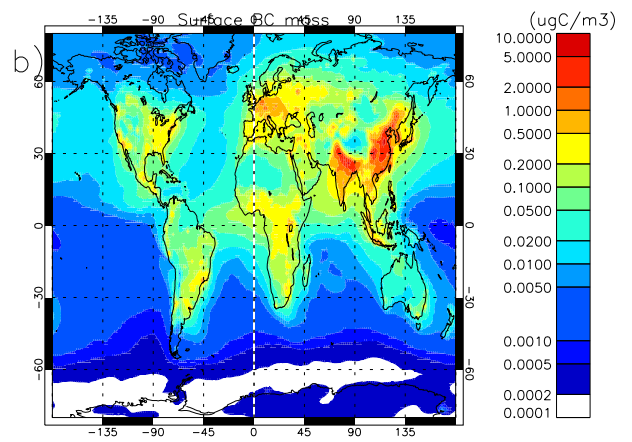
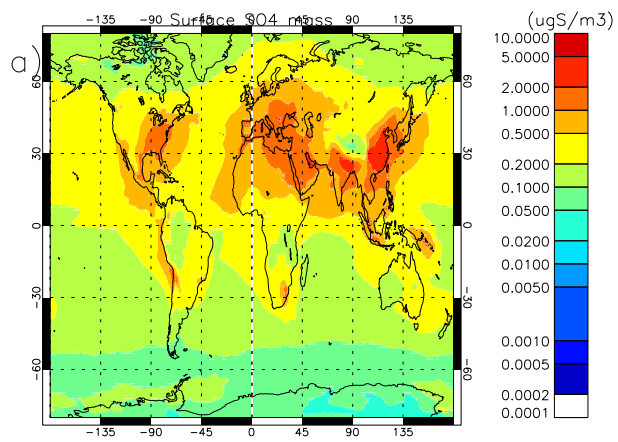
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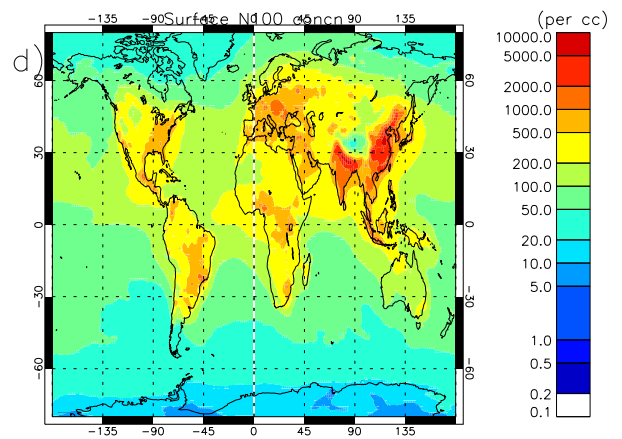
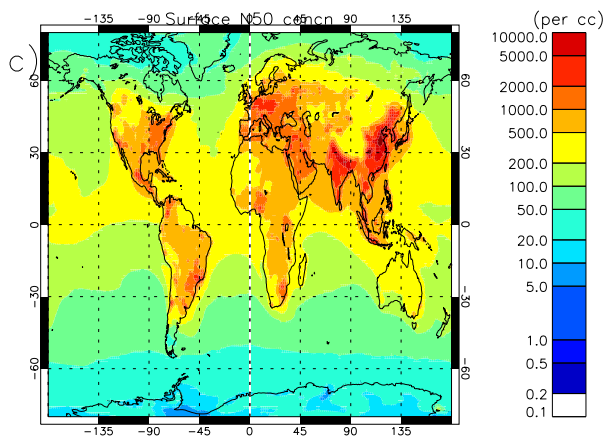
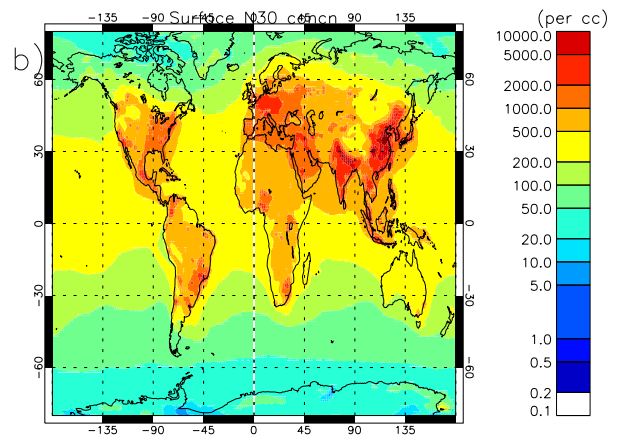
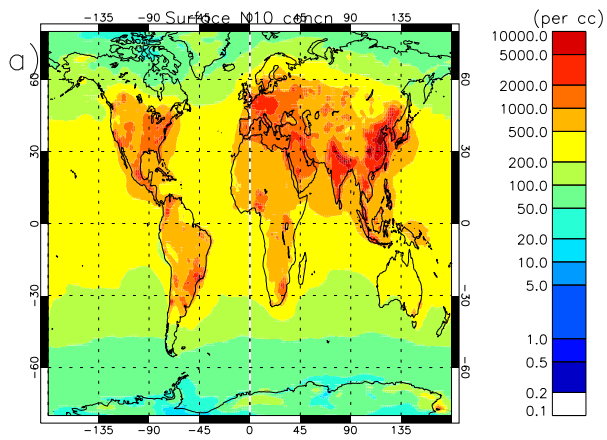
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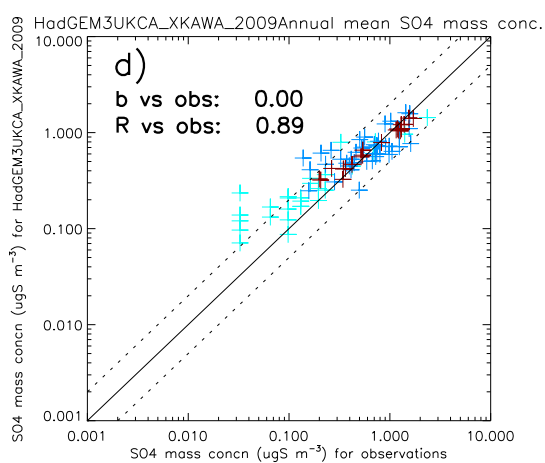
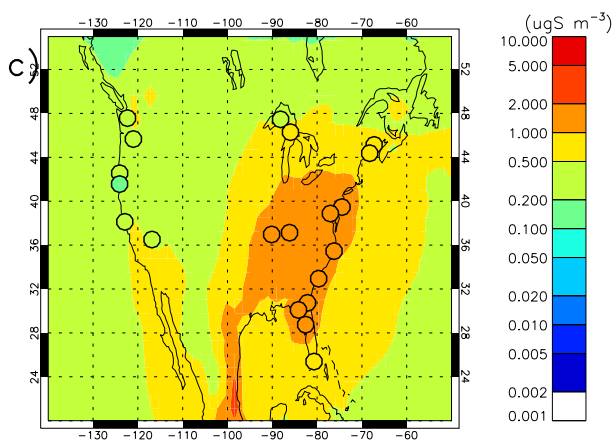
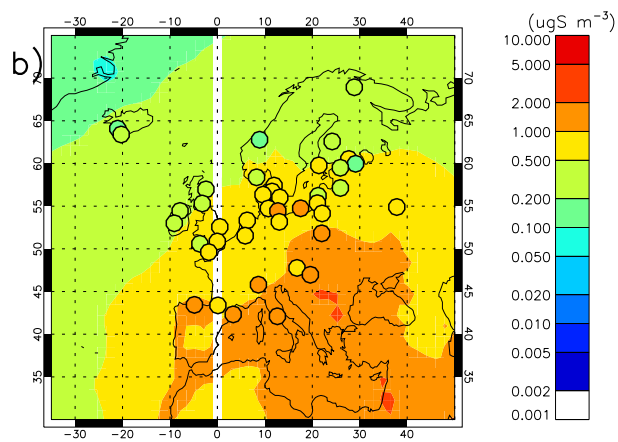
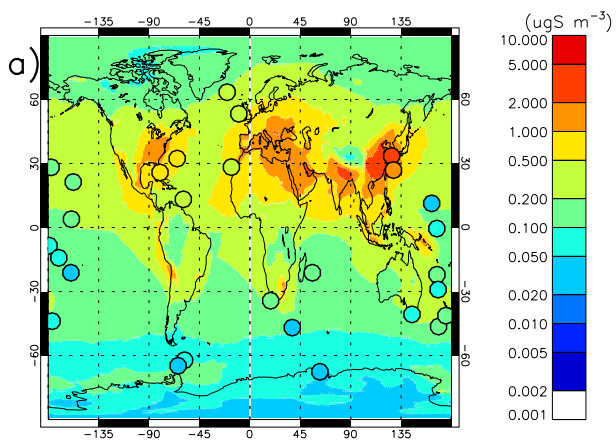


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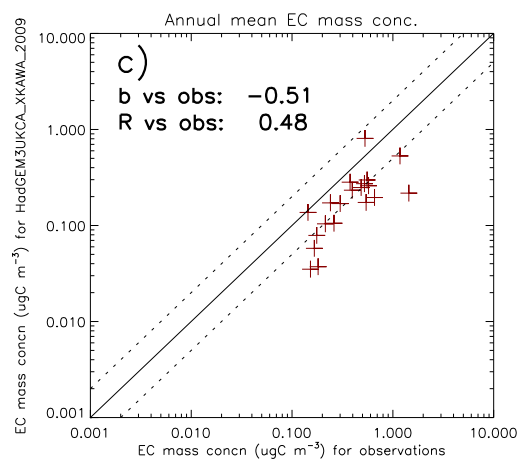
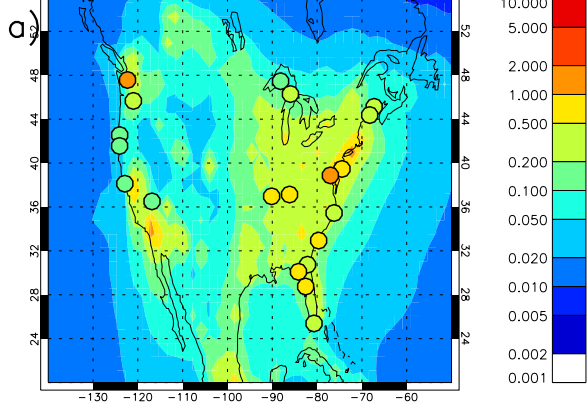


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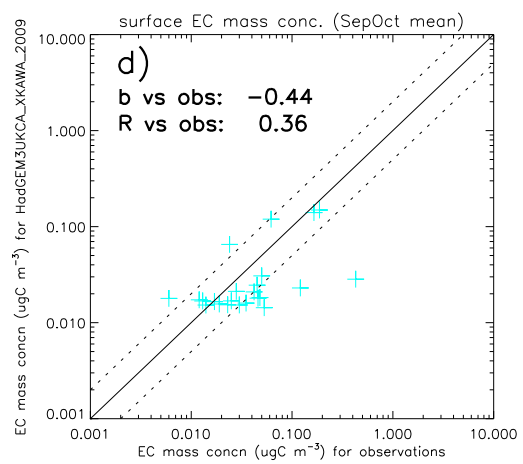
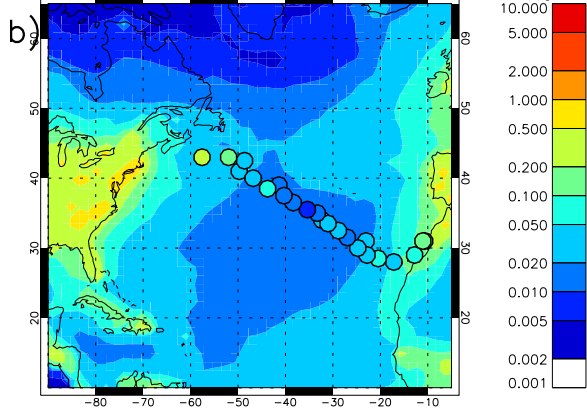


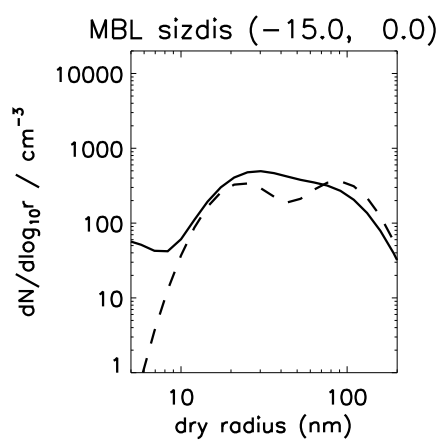
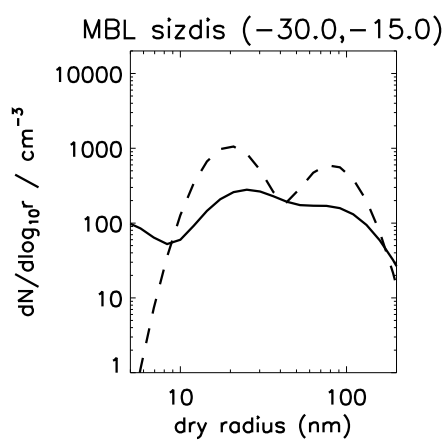
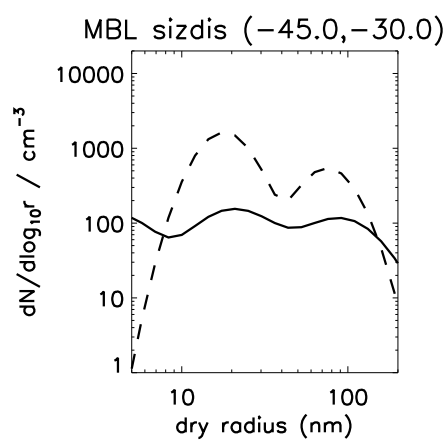
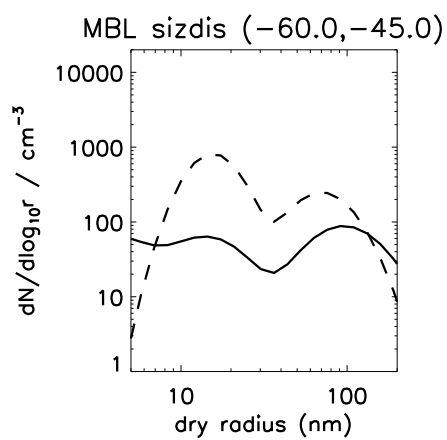
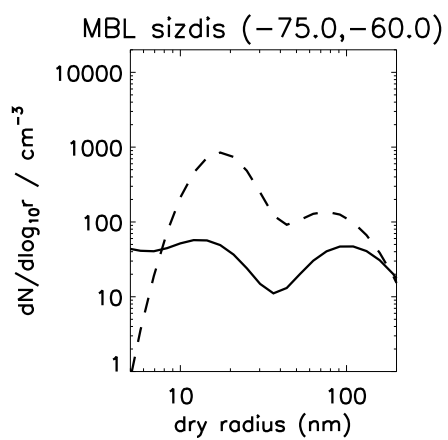
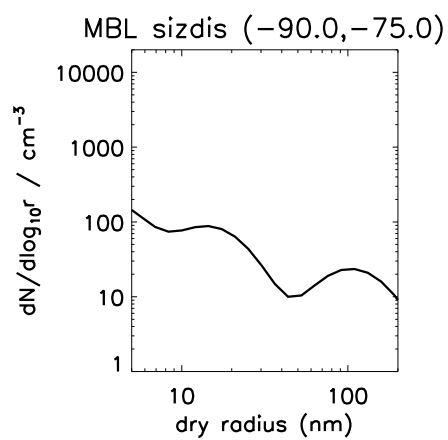


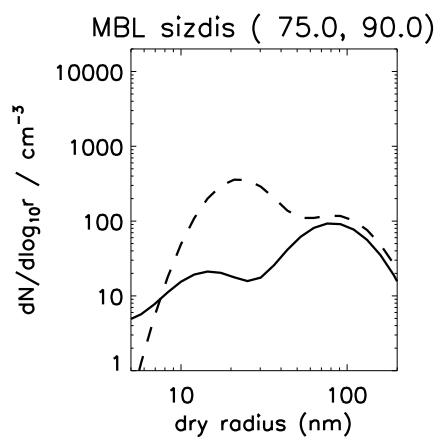
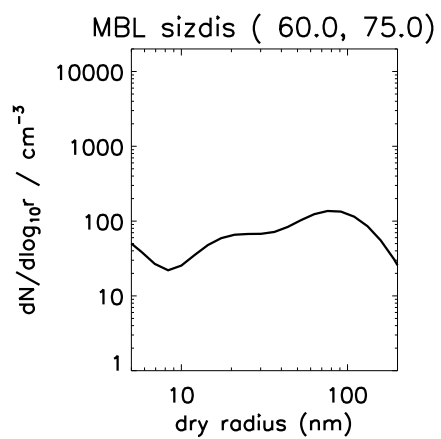
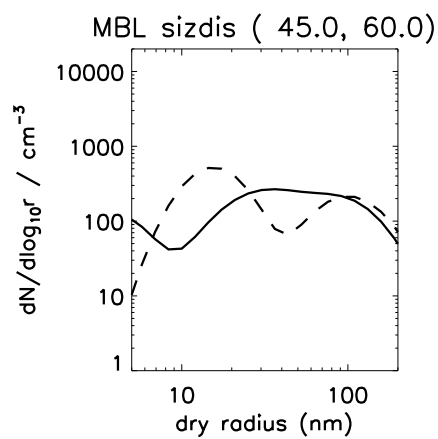
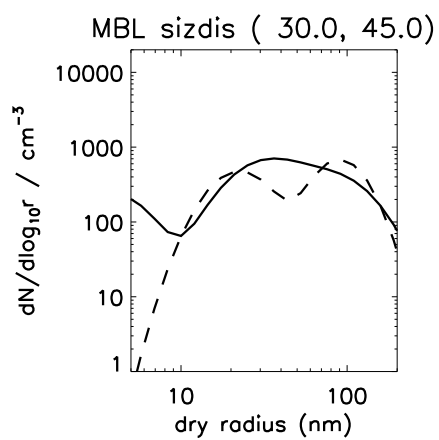
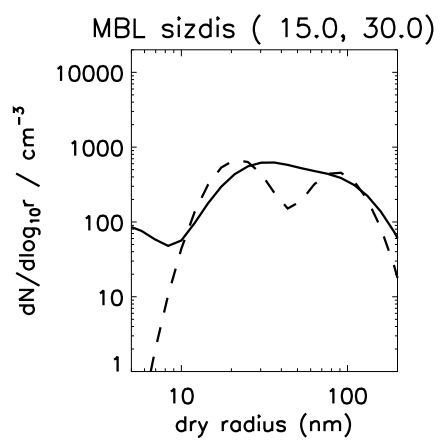
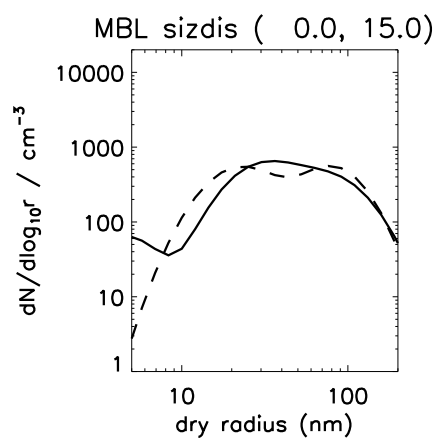
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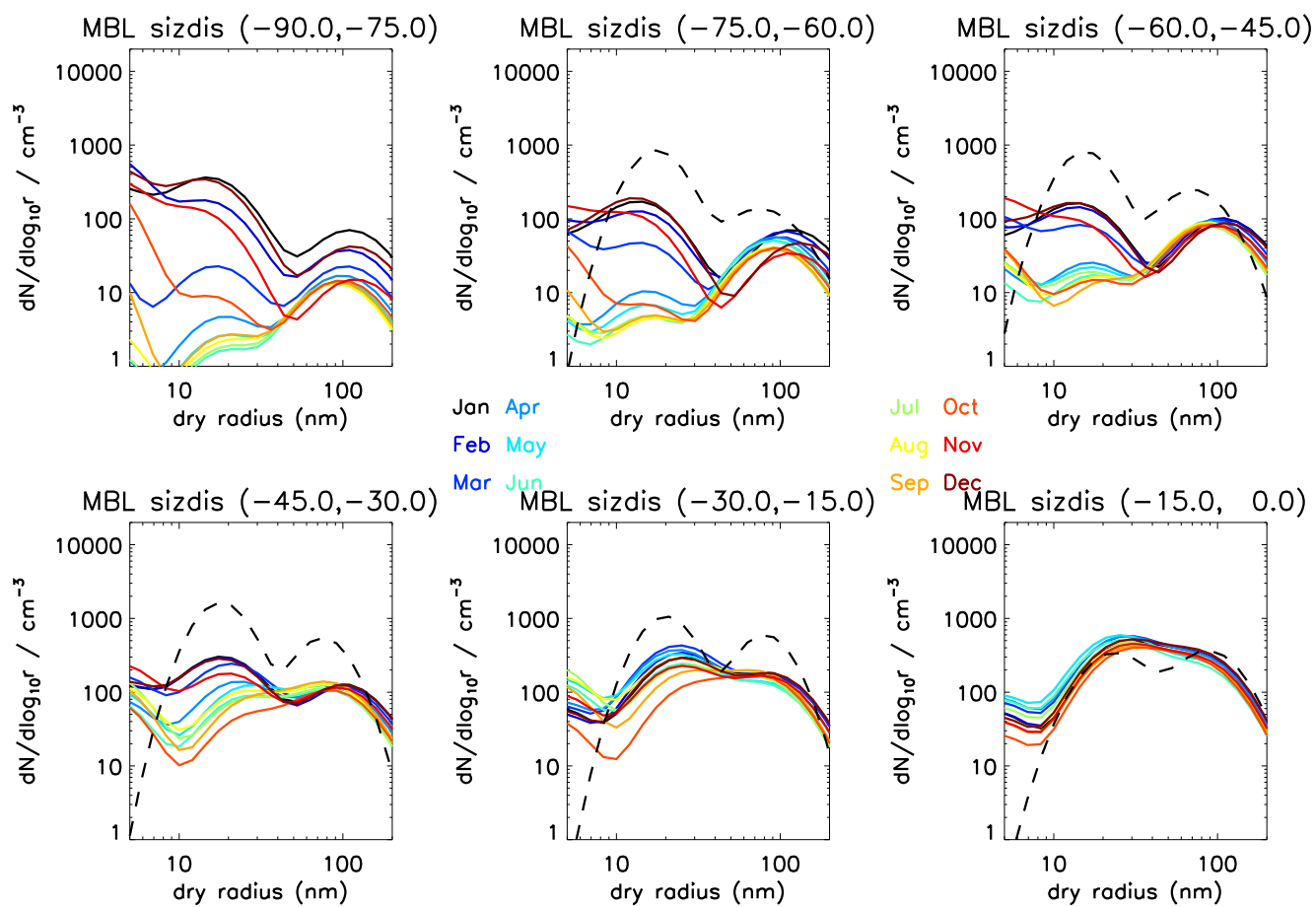


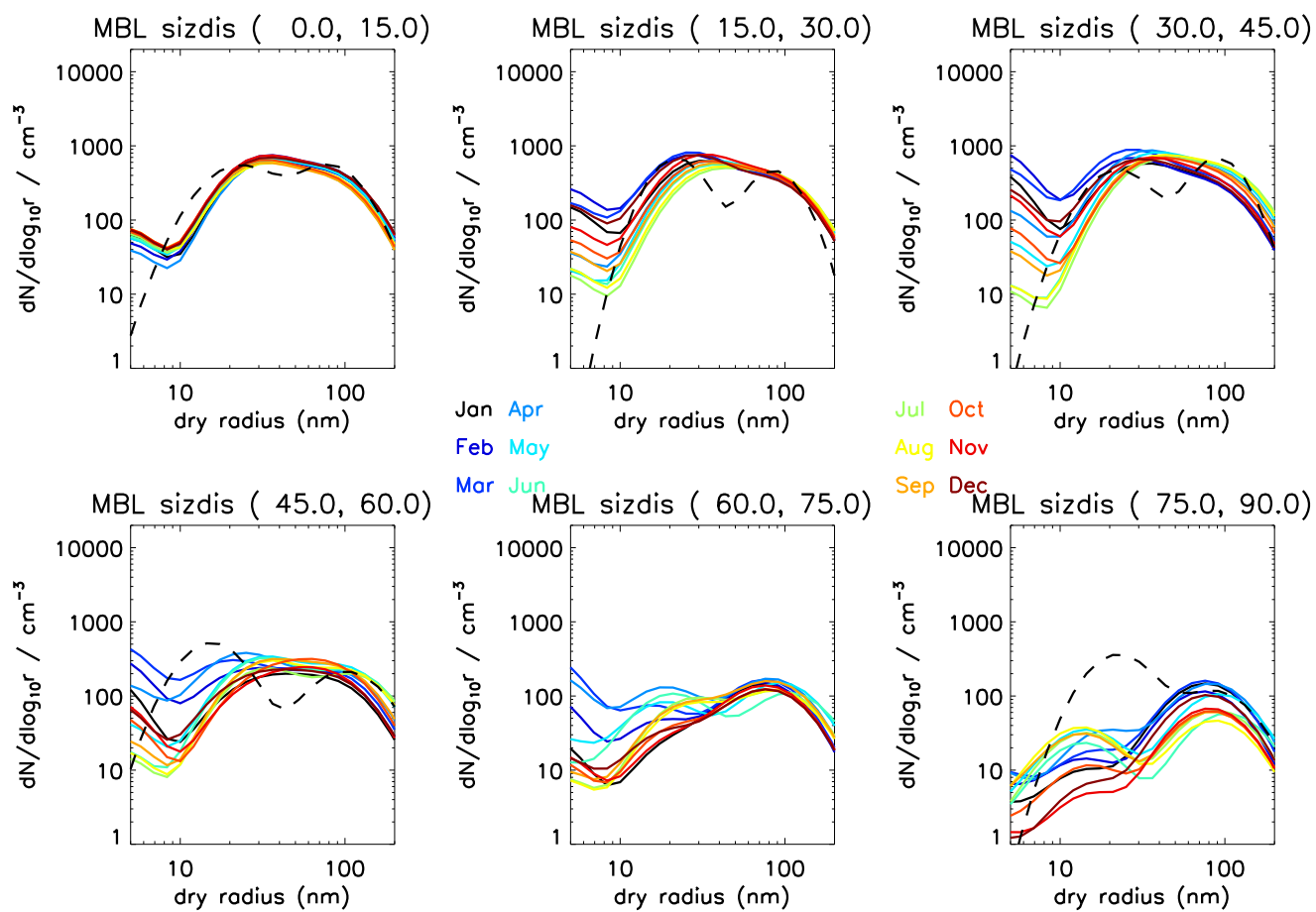
HadGEM3UKCA-XKAWA2009 surface EC mass conc. (SepOct mean) ($\mu\text{gC m}^{-3}$)



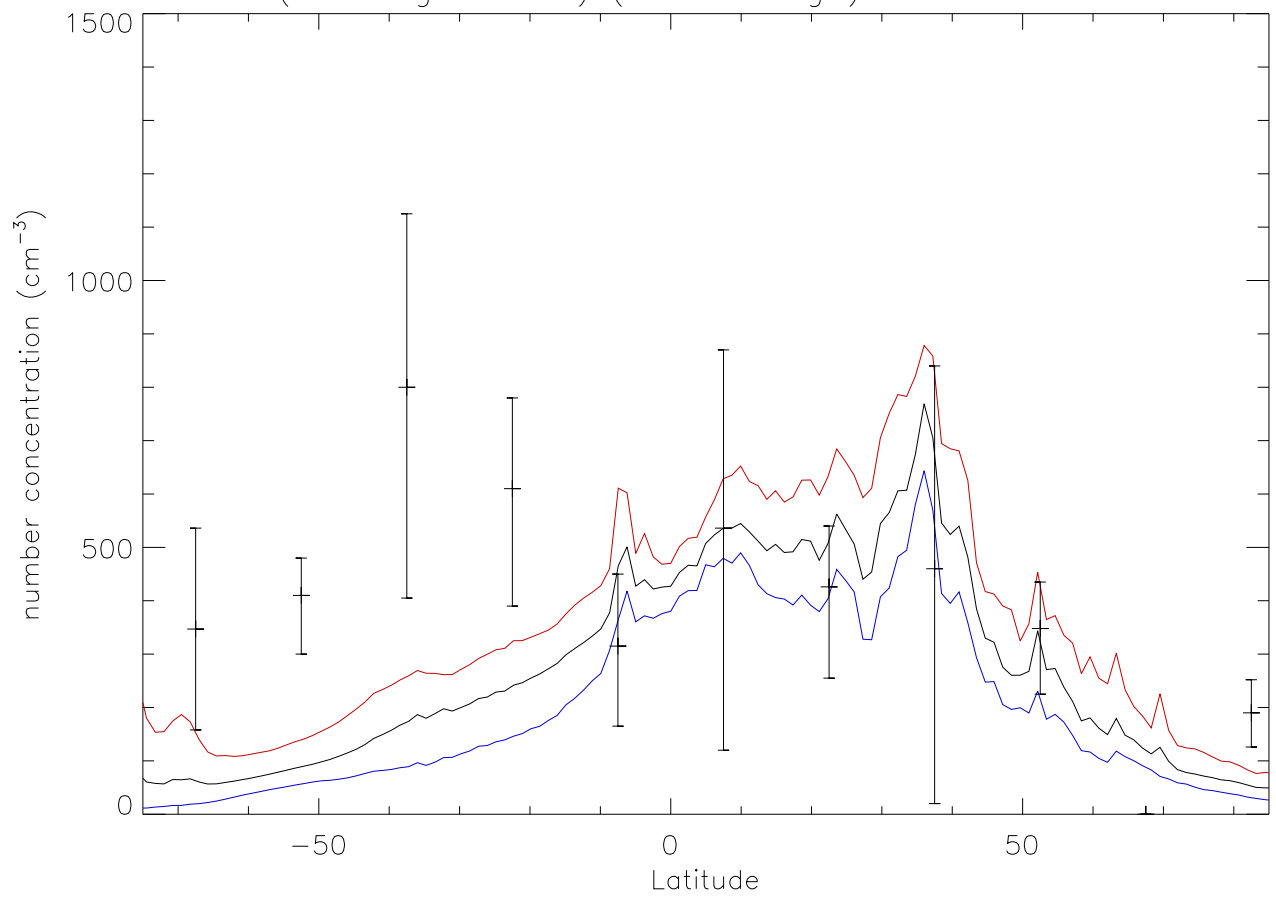




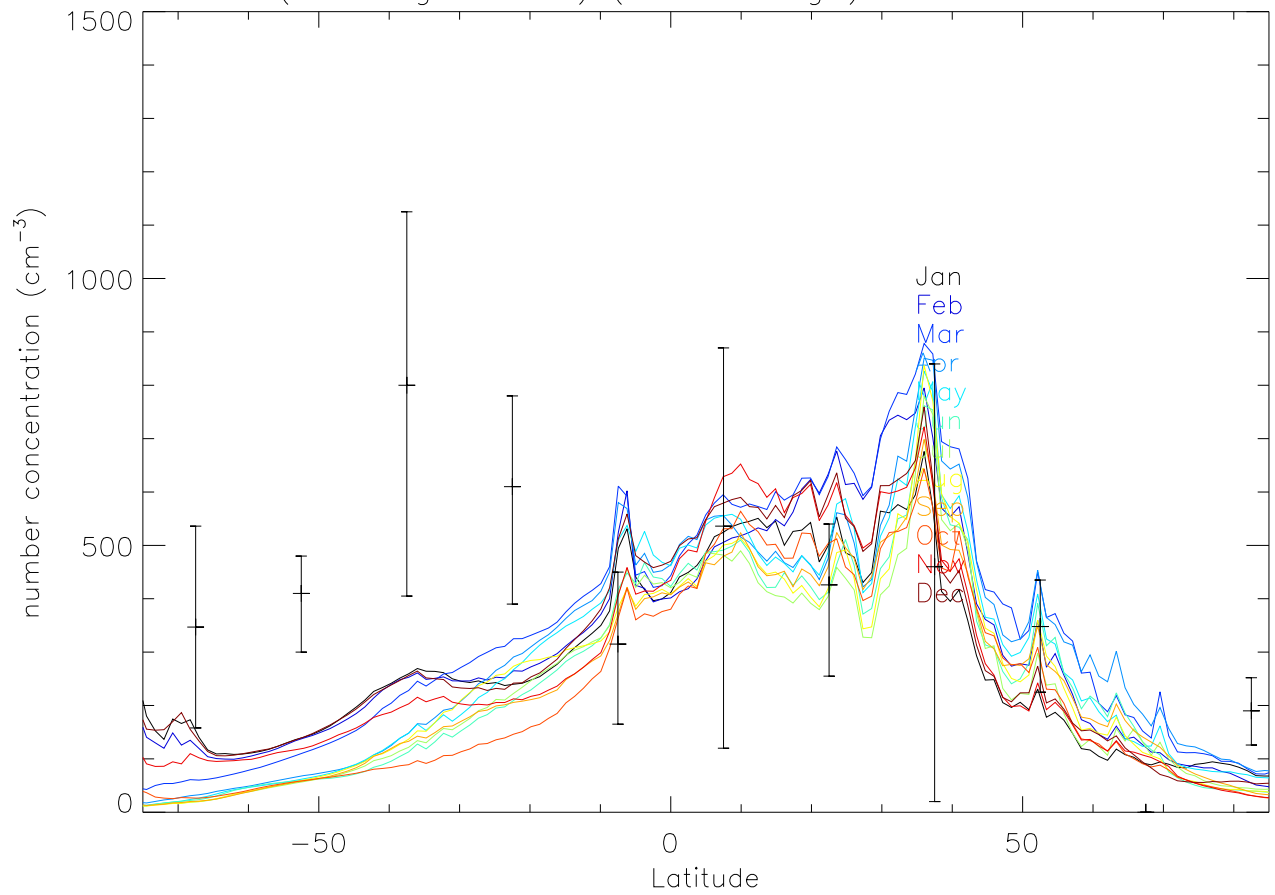




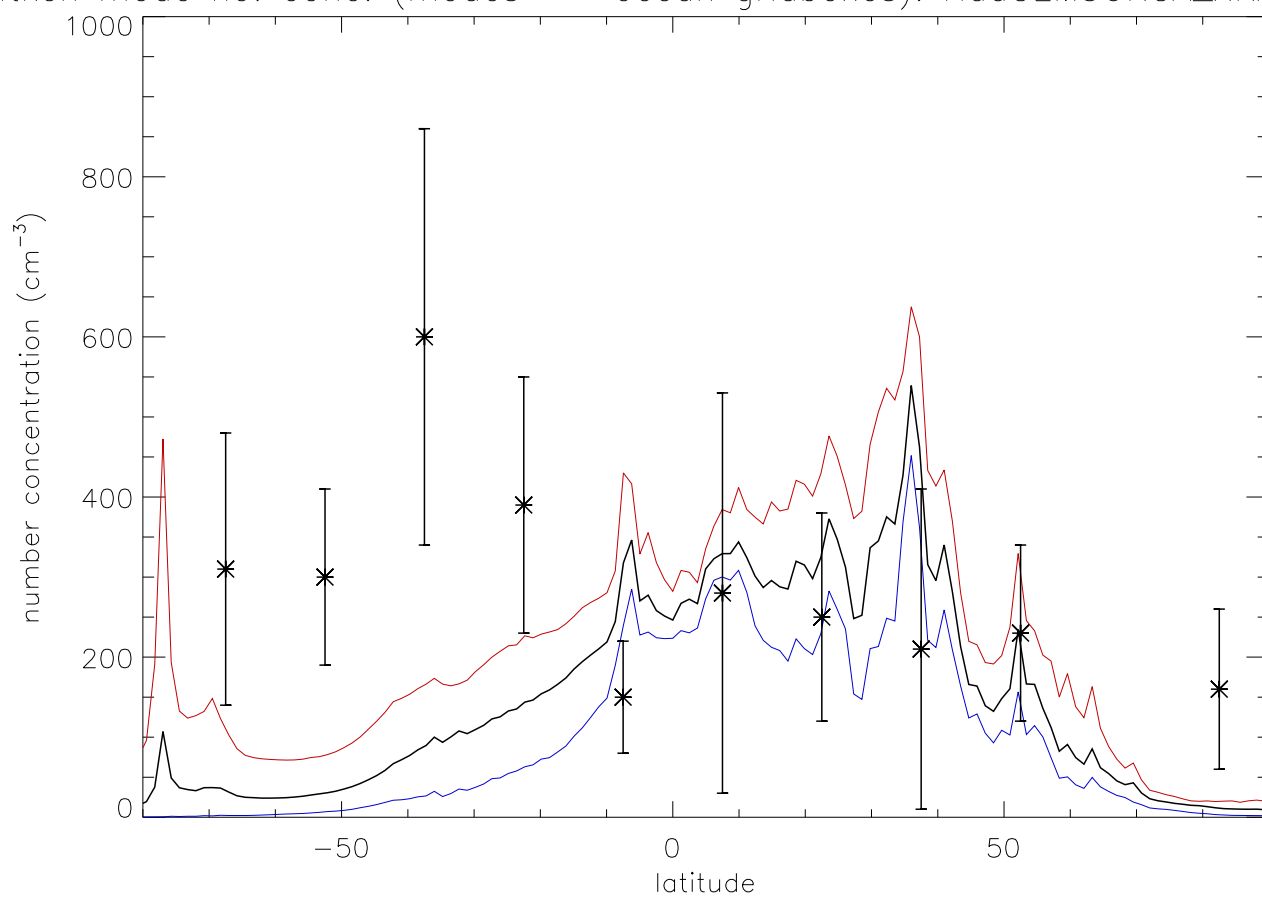
CN no. conc. (ocean gridboxes) (Heintz00Fig2): HadGEM3UKCA_XKAWA_2009



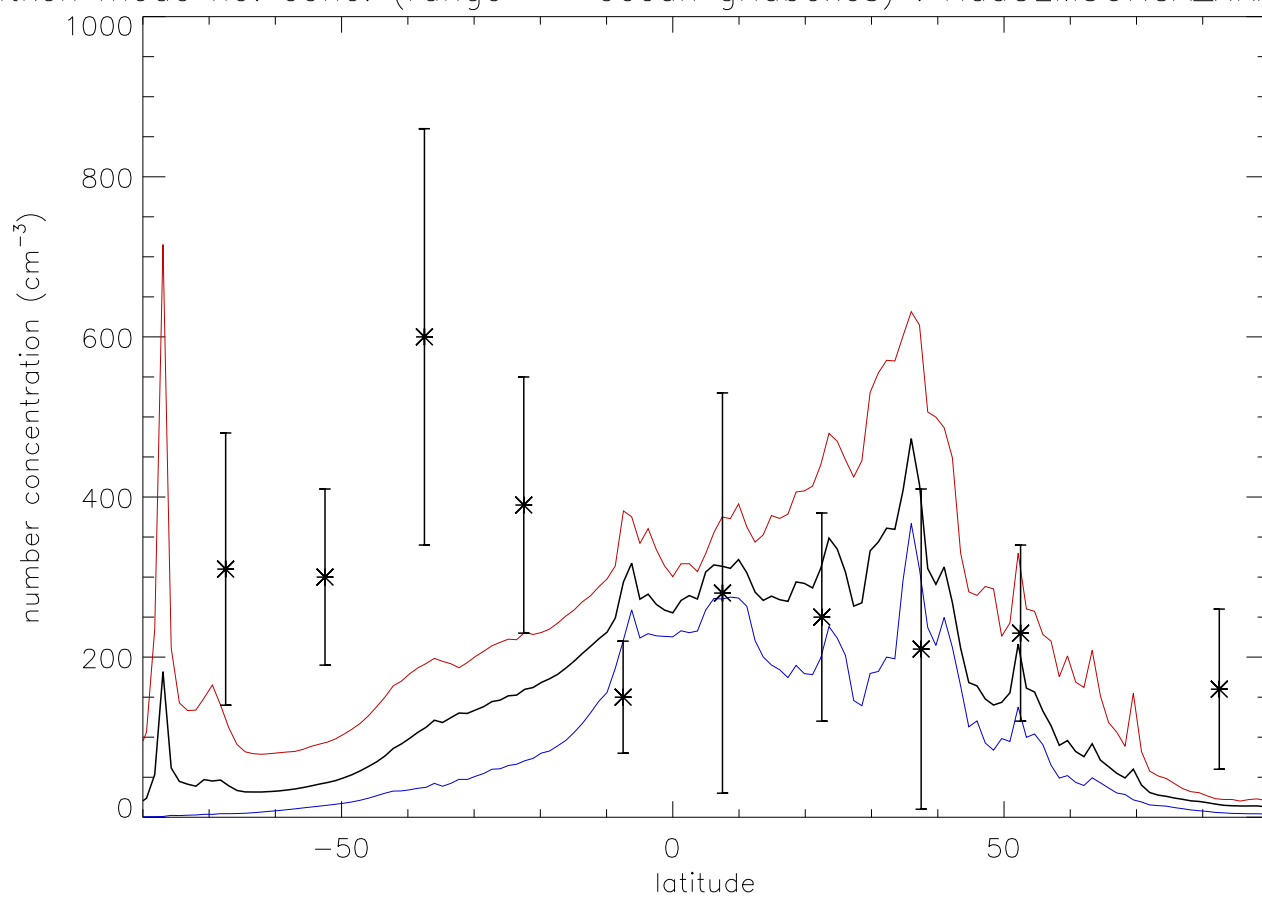
CN no. conc. (ocean gridboxes) (Heintz00Fig2): HadGEM3UKCA_XKAWA_2009



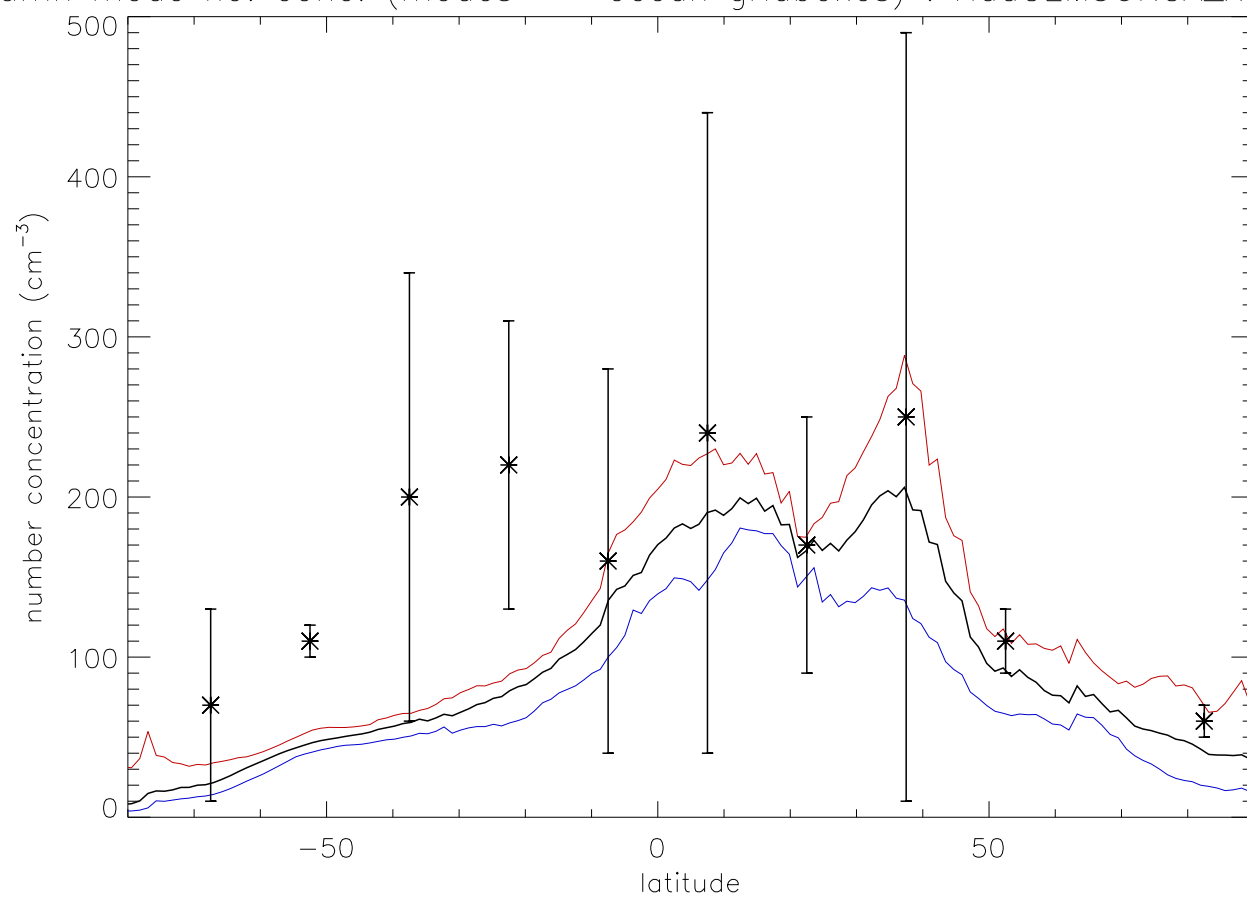
Aitken mode no. conc. (modes -- ocean gridboxes): HadGEM3UKCA_XKAWA_2009



Aitken mode no. conc. (range — ocean gridboxes) : HadGEM3UKCA_XKAWA_2009



accumn mode no. conc. (modes -- ocean gridboxes) : HadGEM3UKCA_XKAWA_20



accumn mode no. conc. (range -- ocean gridboxes) : HadGEM3UKCA_XKAWA_200

