

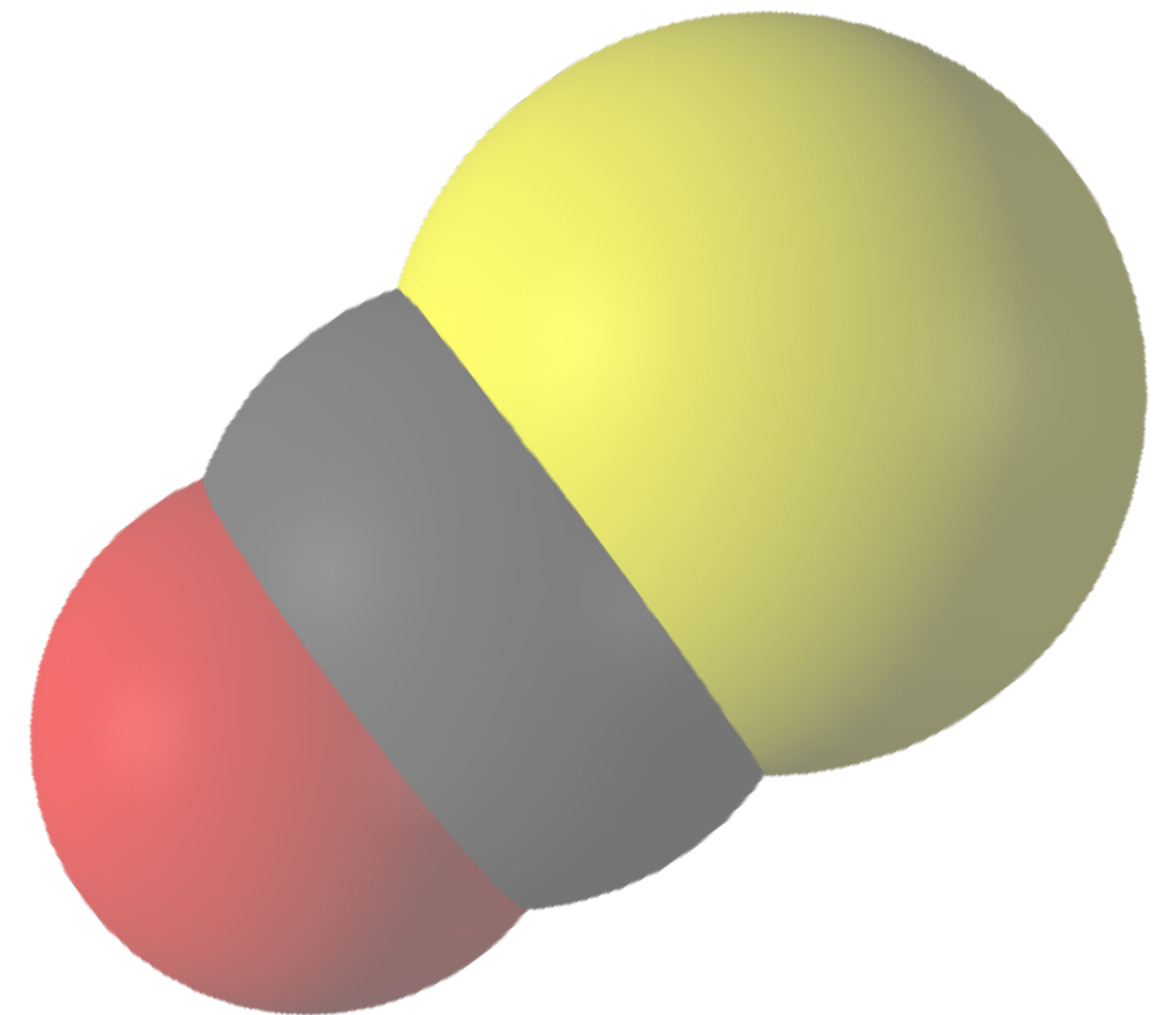
115.78 pm



156.01 pm

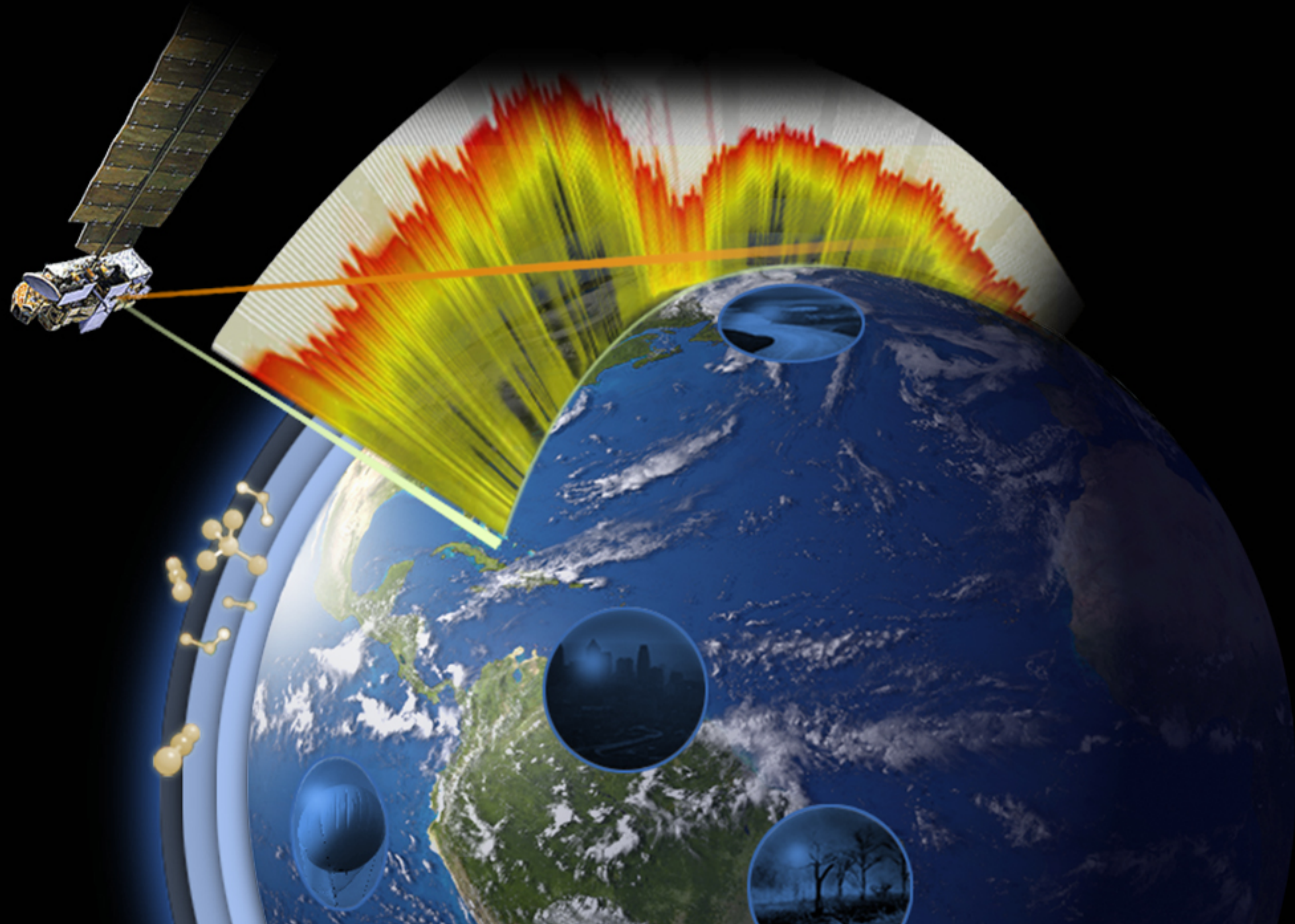
## *Use of satellite data*

**Maarten Krol, COS modelling workshop,**  
Rotterdam, Jan 27, 2020

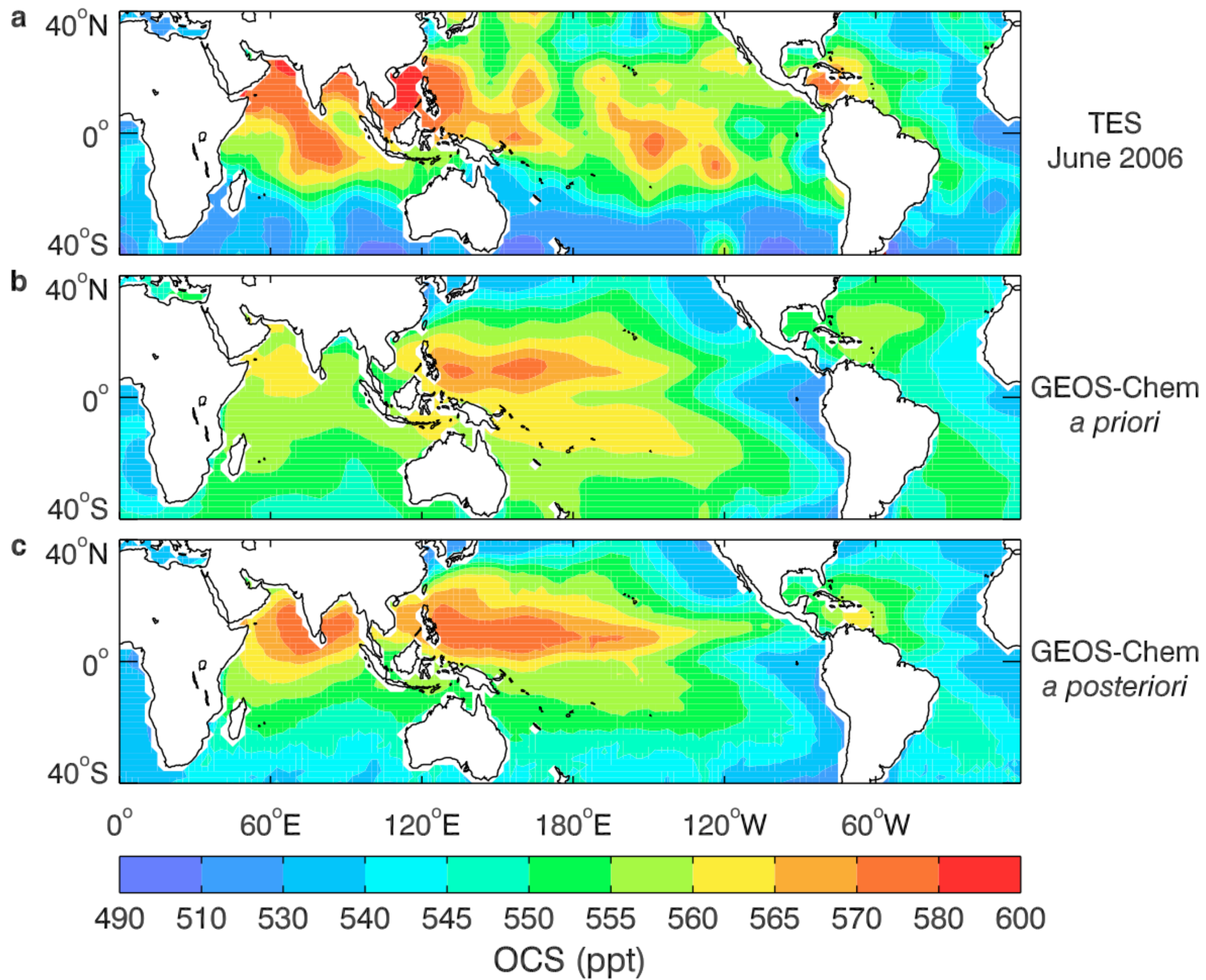




# TES





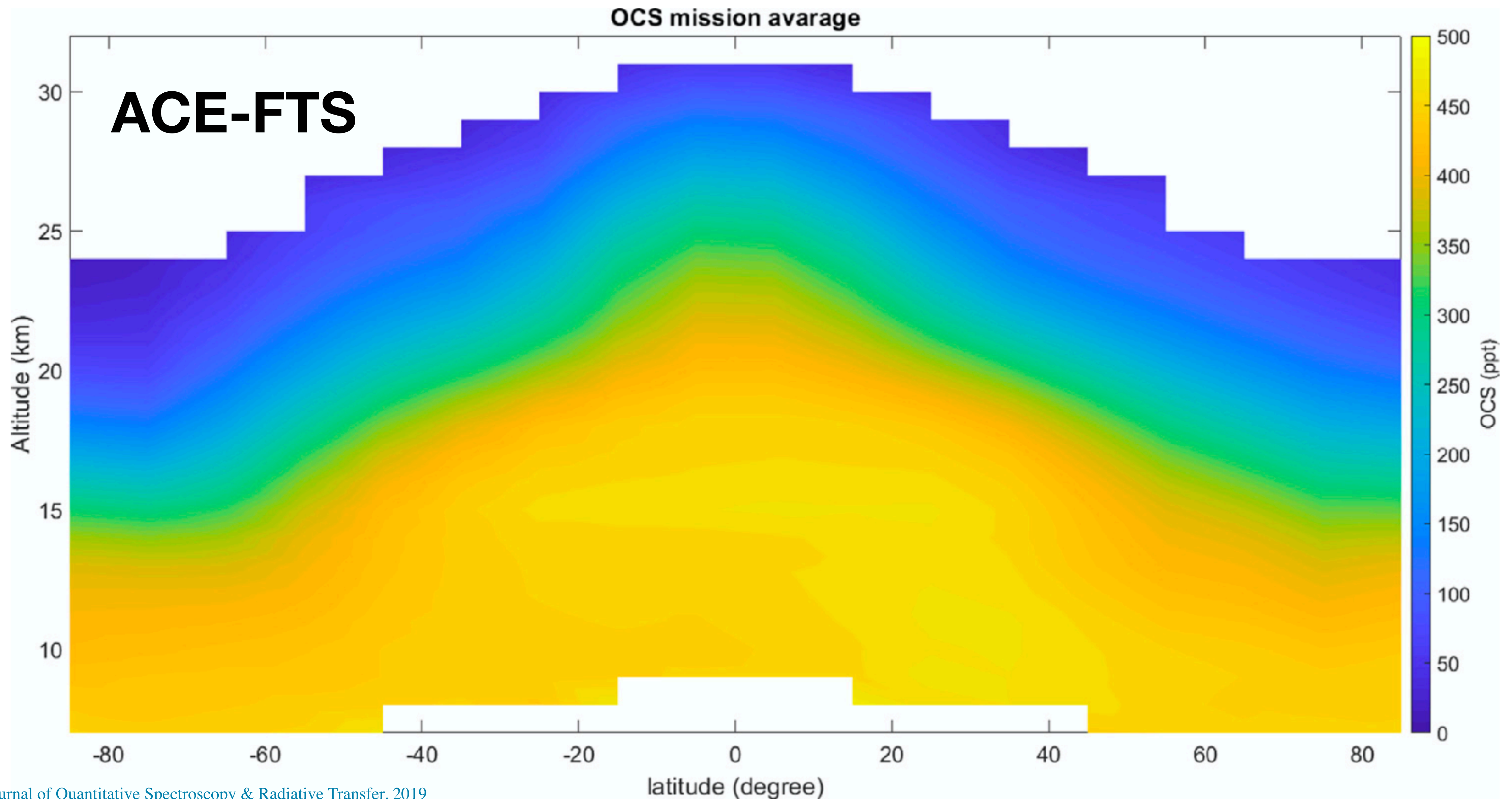


Kuai et al., JGR, 2015



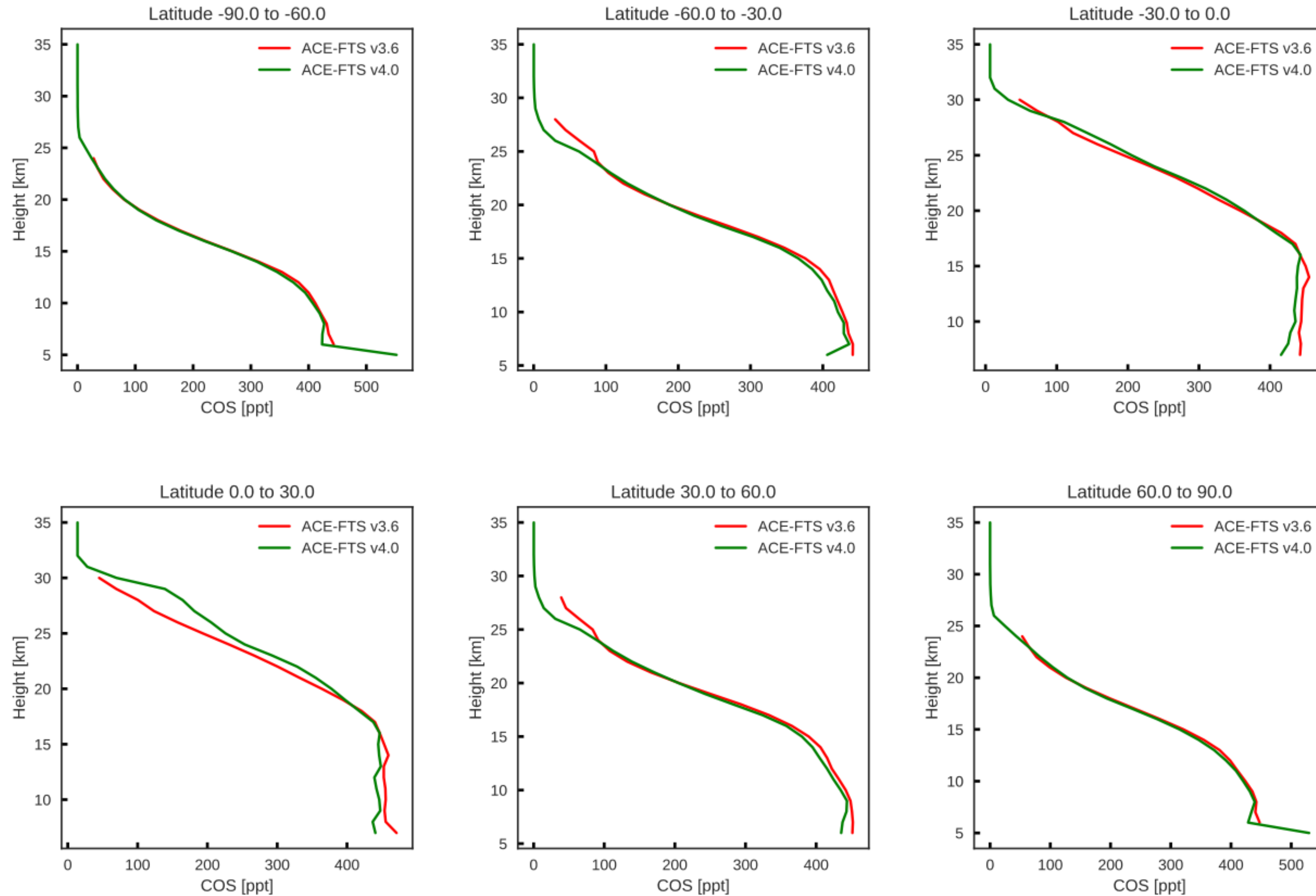
# Global measurements of atmospheric carbonyl sulfide (OCS), $\text{OC}^{34}\text{S}$ and $\text{O}^{13}\text{CS}$

Mahdi Yousefi<sup>a</sup>, Peter F Bernath<sup>a,b,c,\*</sup>, Chris D Boone<sup>c</sup>, Geoffrey C Toon<sup>d</sup>





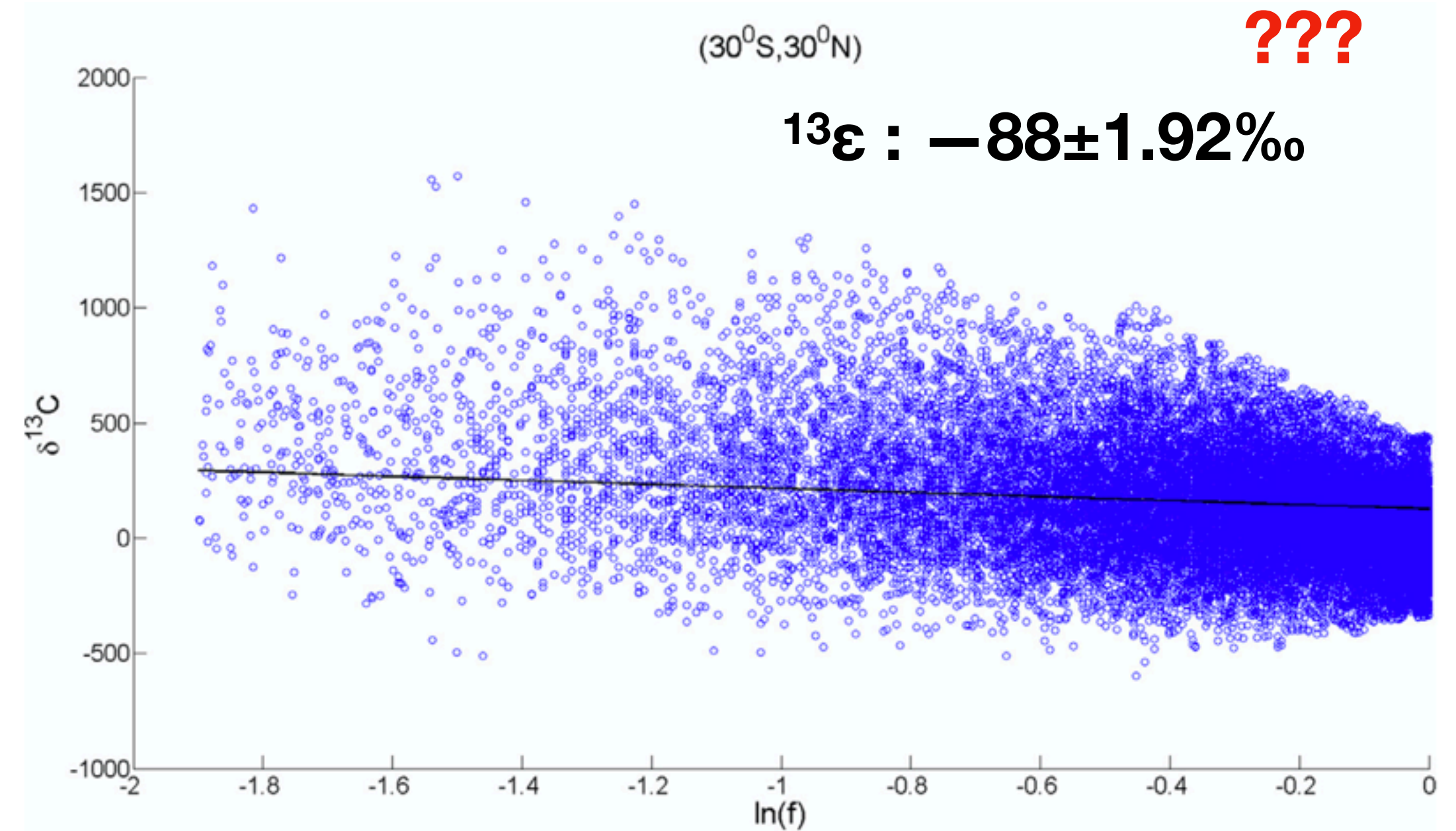
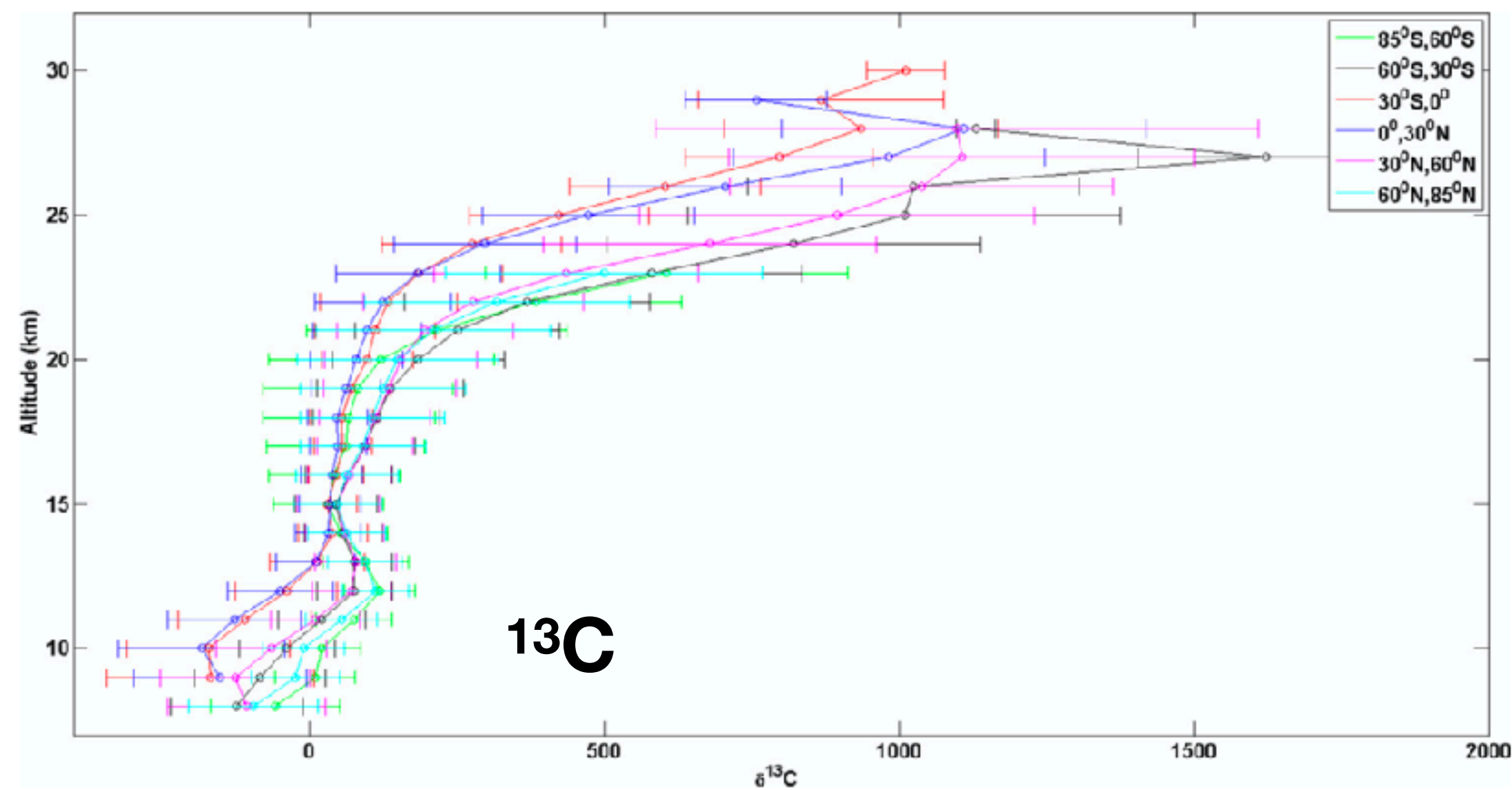
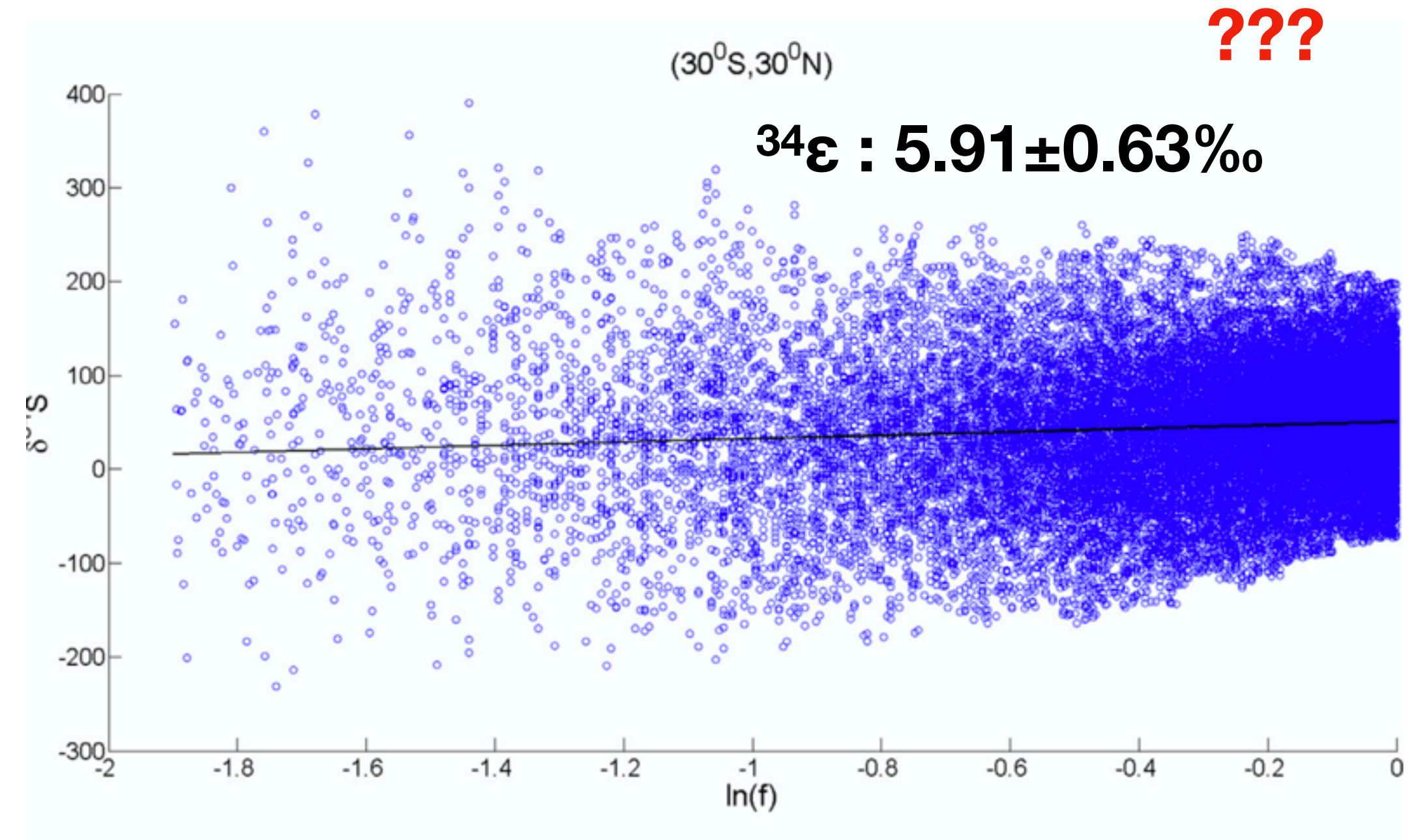
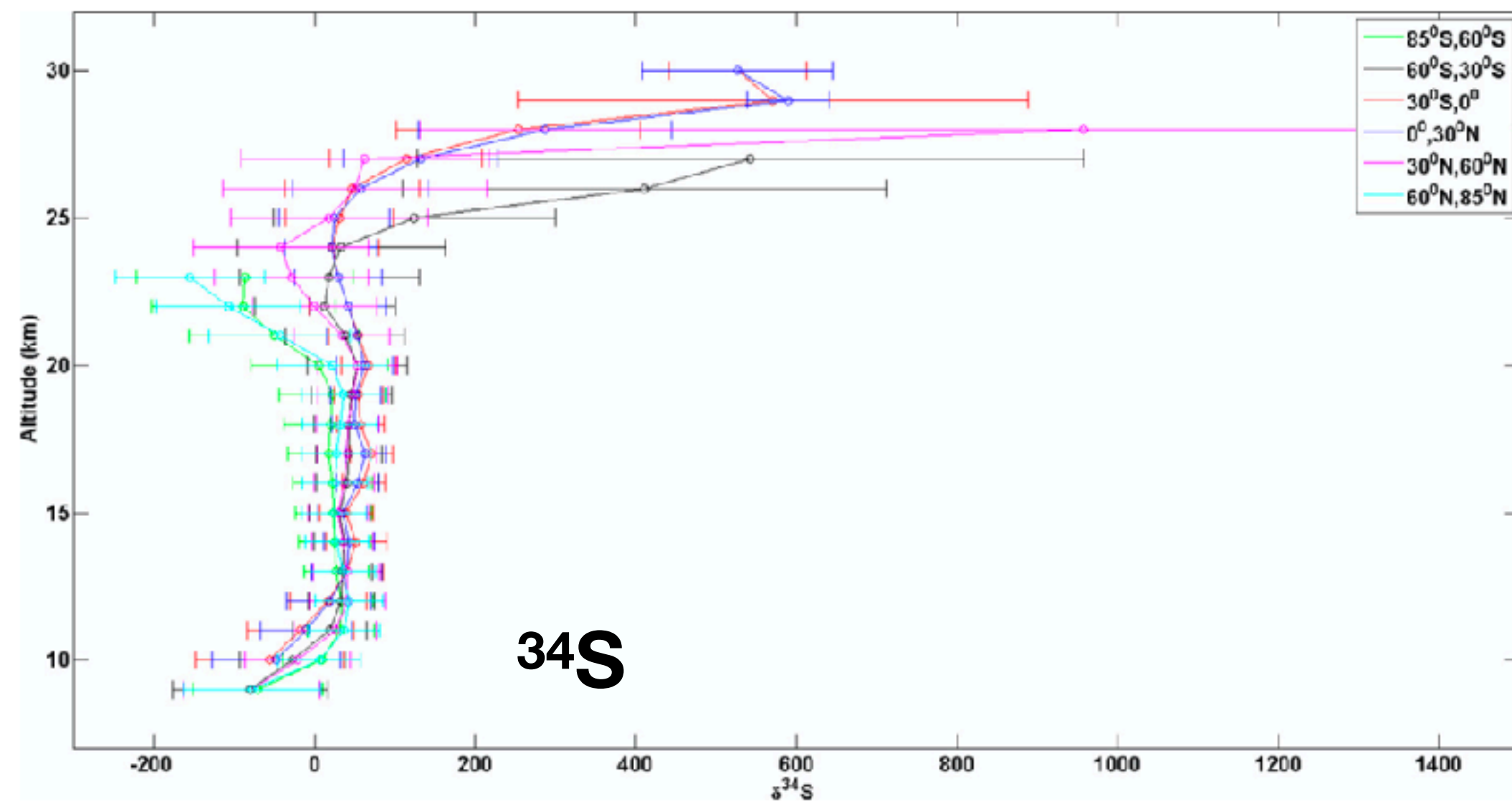
# ACE-FTS V4.0 & V3.6





# ACE-FTS

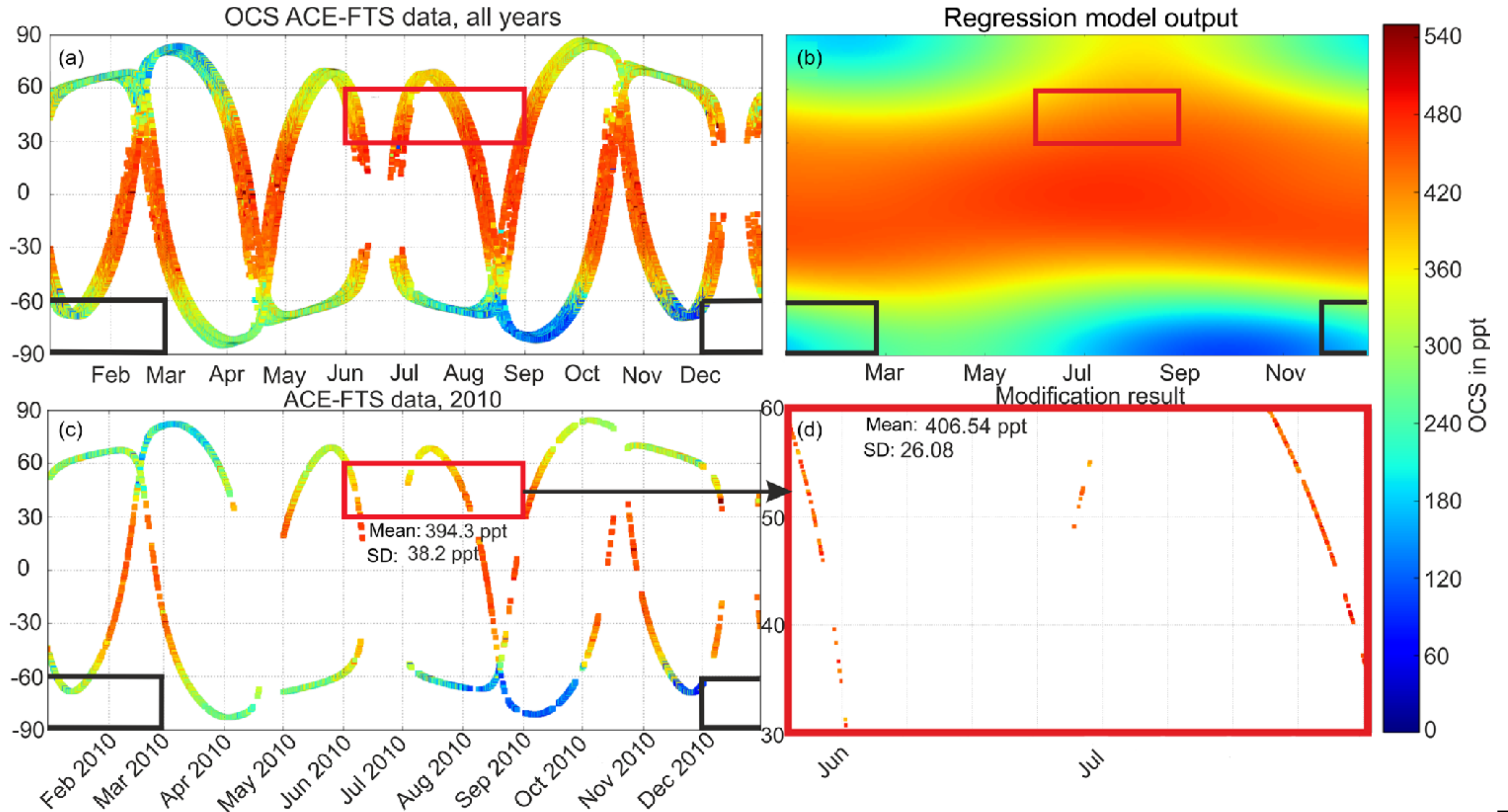
COS-OCs





# Sampling bias adjustment for sparsely sampled satellite measurements applied to ACE-FTS carbonyl sulfide observations

Corinna Kloss<sup>1,2</sup>, Marc von Hobe<sup>1</sup>, Michael Höpfner<sup>3</sup>, Kaley A. Walker<sup>4</sup>,  
Martin Riese<sup>1</sup>, Jörn Ungermann<sup>1</sup>, Birgit Hassler<sup>5</sup>, Stefanie Kremser<sup>6</sup>,  
and Greg E. Bodeker<sup>6</sup>





# Fast retrievals of tropospheric carbonyl sulfide with IASI

R. Anthony Vincent and Anu Dudhia

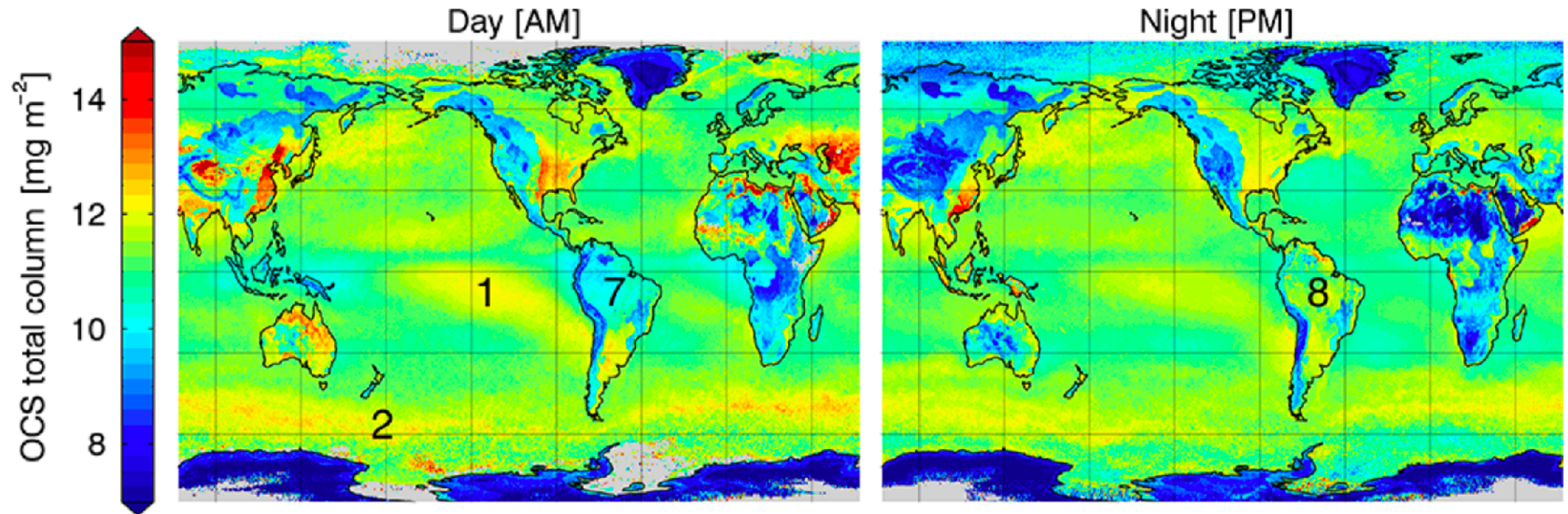
Atmospheric, Oceanic, and Planetary Physics, Oxford University, Clarendon Laboratory, Parks Road, Oxford OX1 3PU, UK

Correspondence to: R. Anthony Vincent (vincent@atm.ox.ac.uk)

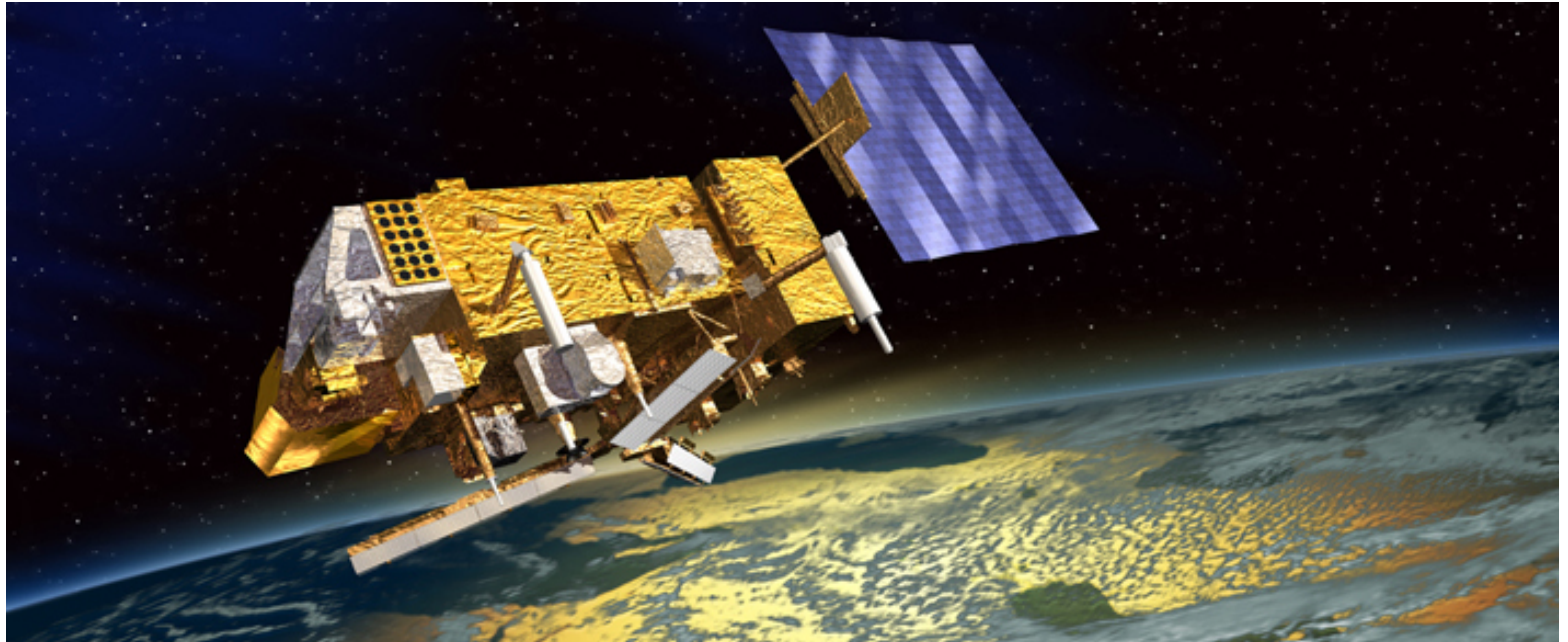
Received: 1 September 2016 – Discussion started: 20 September 2016

Revised: 30 January 2017 – Accepted: 1 February 2017 – Published: 28 February 2017

2014





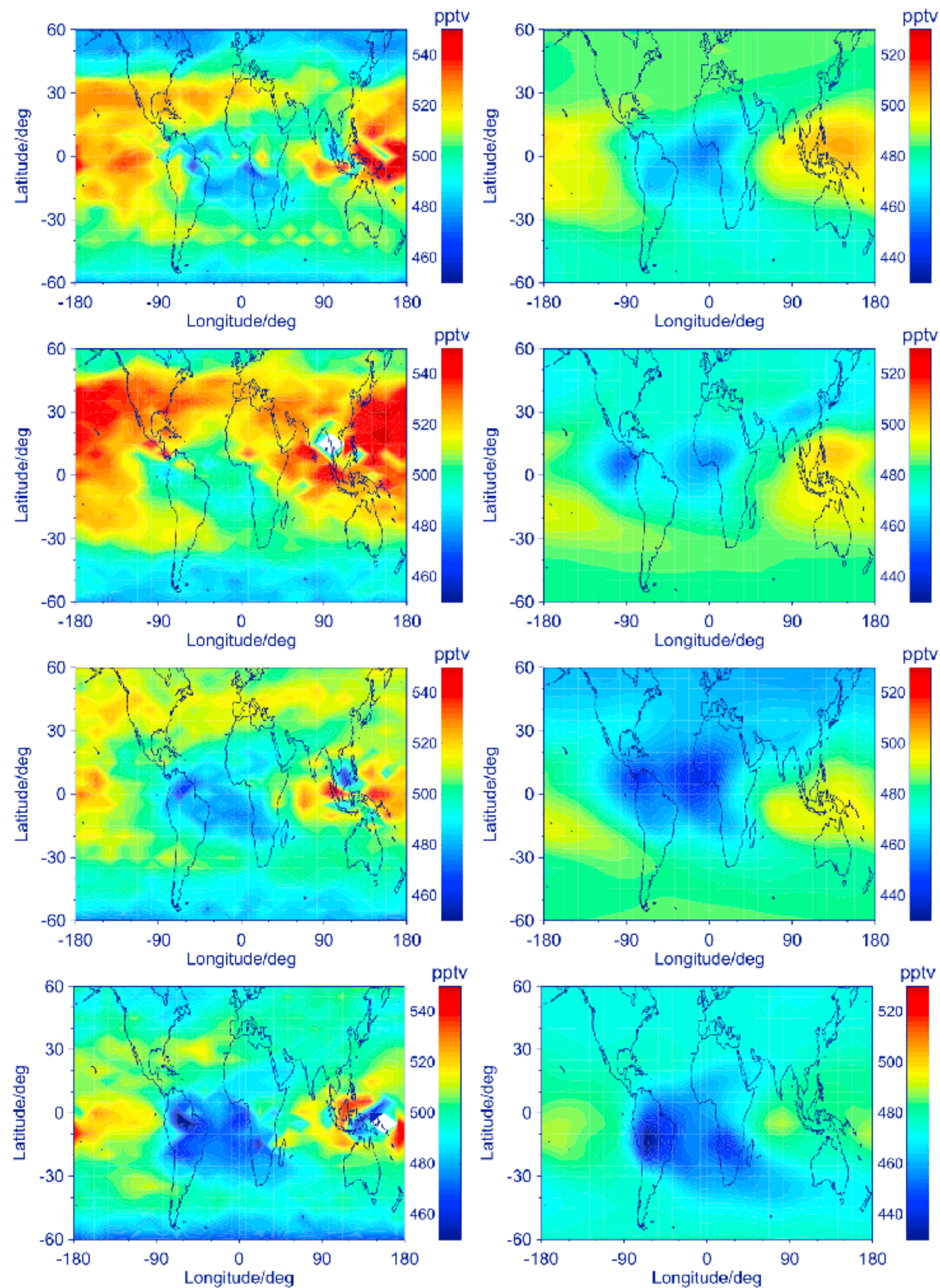


## MIPAS Instrument

The Michelson Interferometer for Passive Atmospheric Sounding (MIPAS) is a Fourier transform spectrometer for the measurement of high-resolution gaseous emission spectra at the Earth's limb. MIPAS was launched on the ESA platform ENVISAT in 2002 and operated until XXX. The MIPAS instrument measured in the near to mid-infrared ( $4.15 - 14.6 \mu\text{m}$ ) where many of the atmospheric trace gases that play a major role in atmospheric chemistry have important emission features.



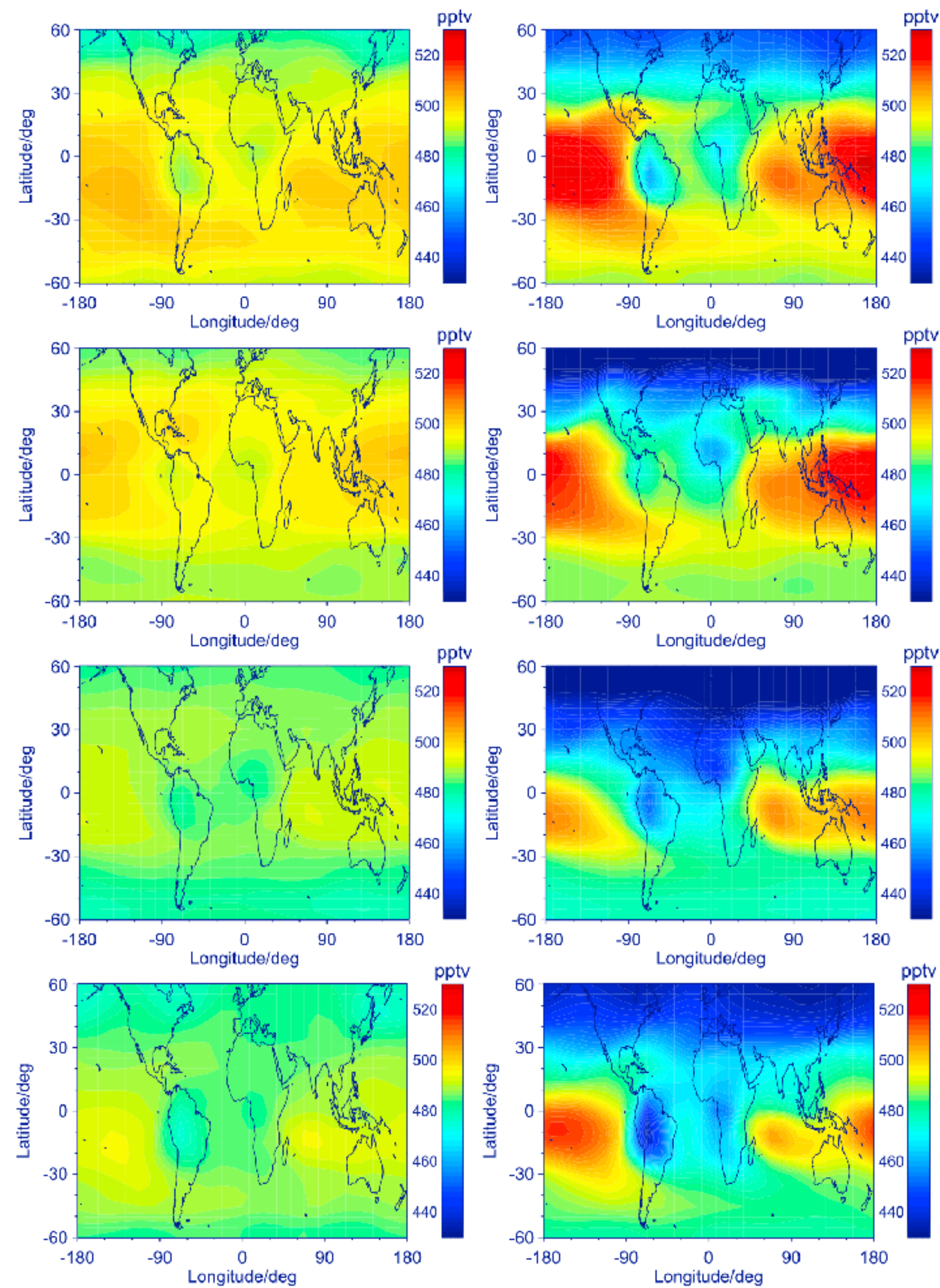
@ 250 hPa



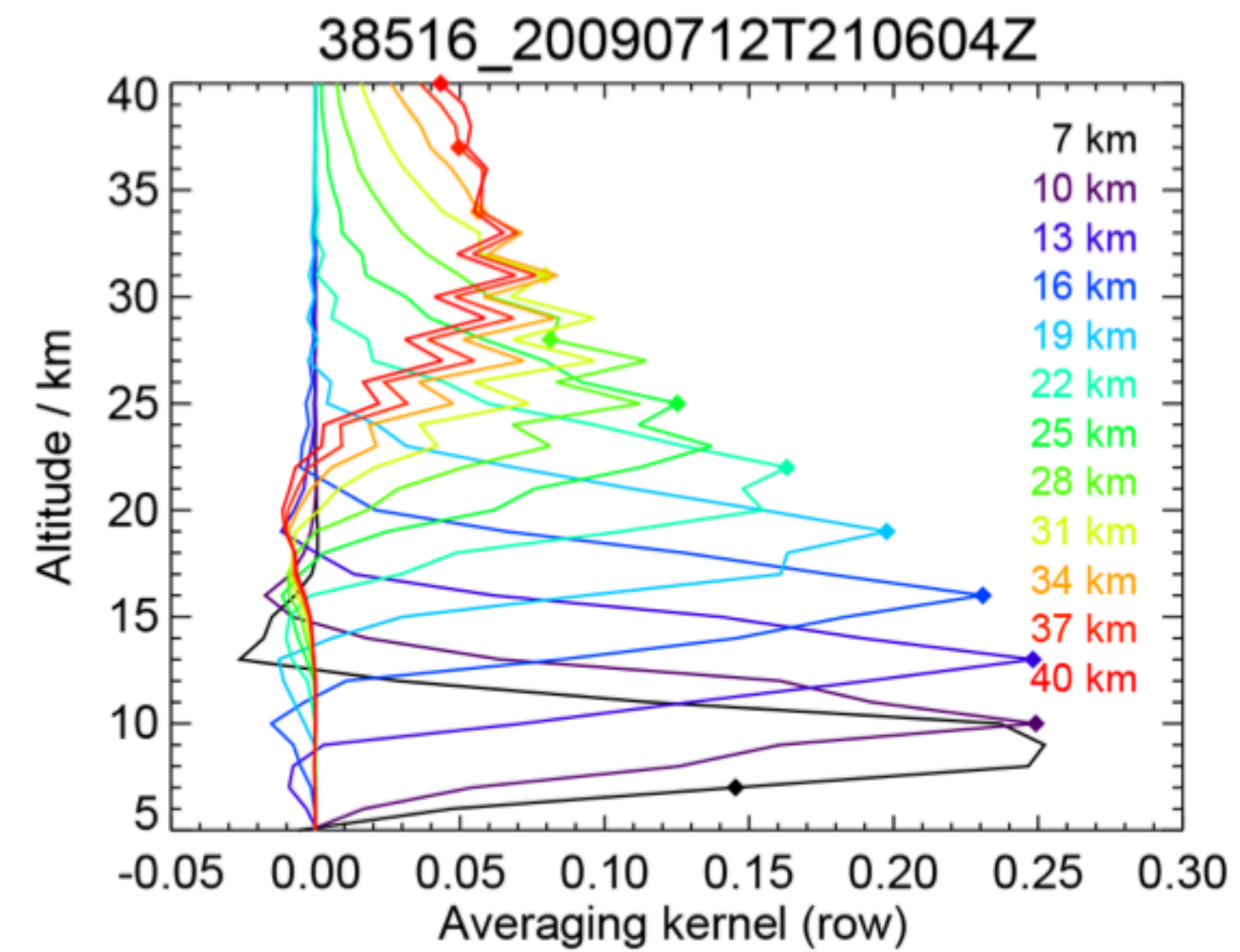
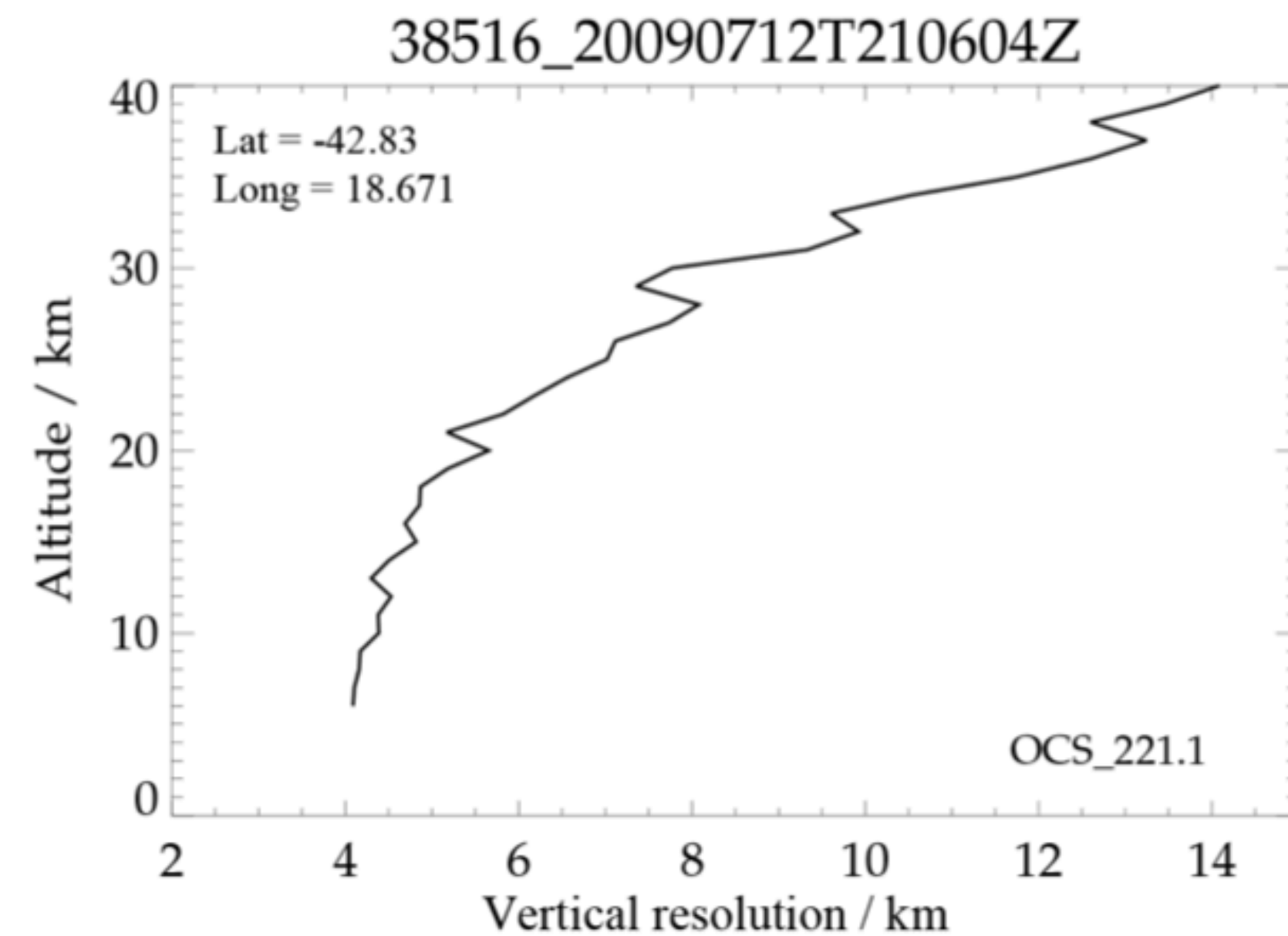
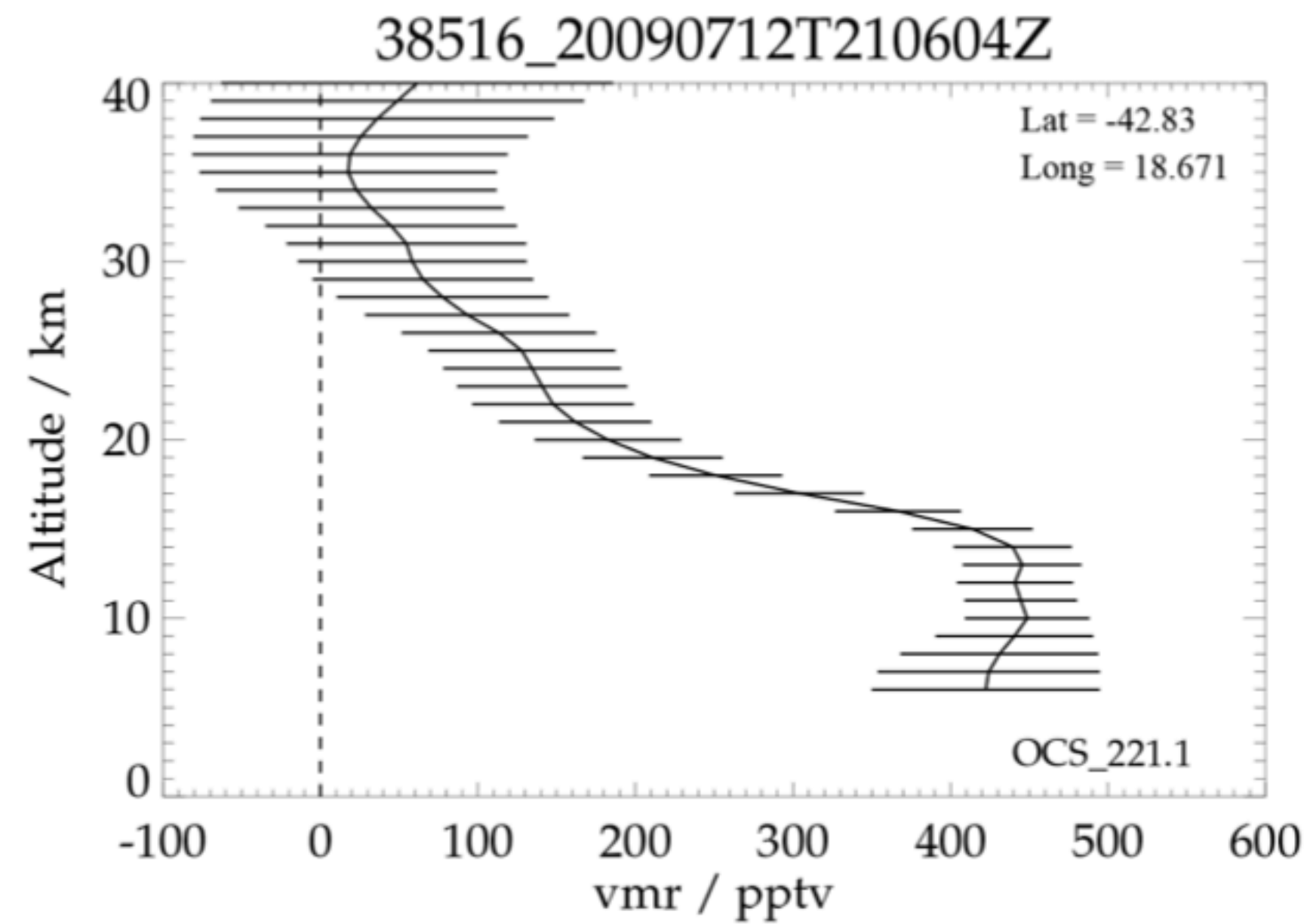
## Tropical sources and sinks of carbonyl sulfide observed from space

N. Glatthor<sup>1</sup>, M. Höpfner<sup>1</sup>, I. T. Baker<sup>2</sup>, J. Berry<sup>3</sup>, J. E. Campbell<sup>4</sup>, S. R. Kawa<sup>5</sup>, G. Krysztofiak<sup>6</sup>, A. Leyser<sup>1</sup>, B.-M. Sinnhuber<sup>1</sup>, G. P. Stiller<sup>1</sup>, J. Stinecipher<sup>7</sup>, and T. von Clarmann<sup>1</sup>

EMAC --&gt; uptake x4. Ocean emissions up





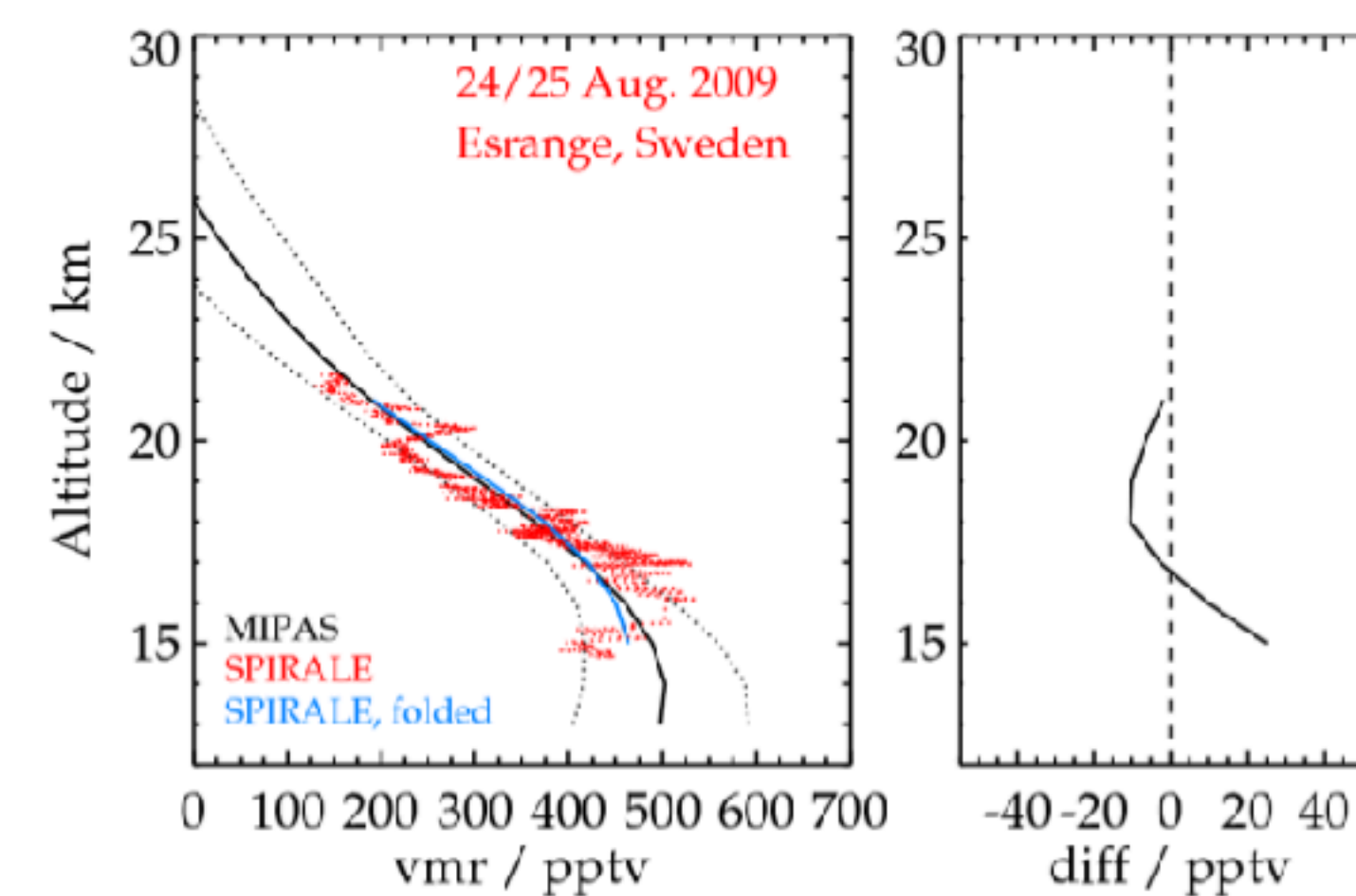
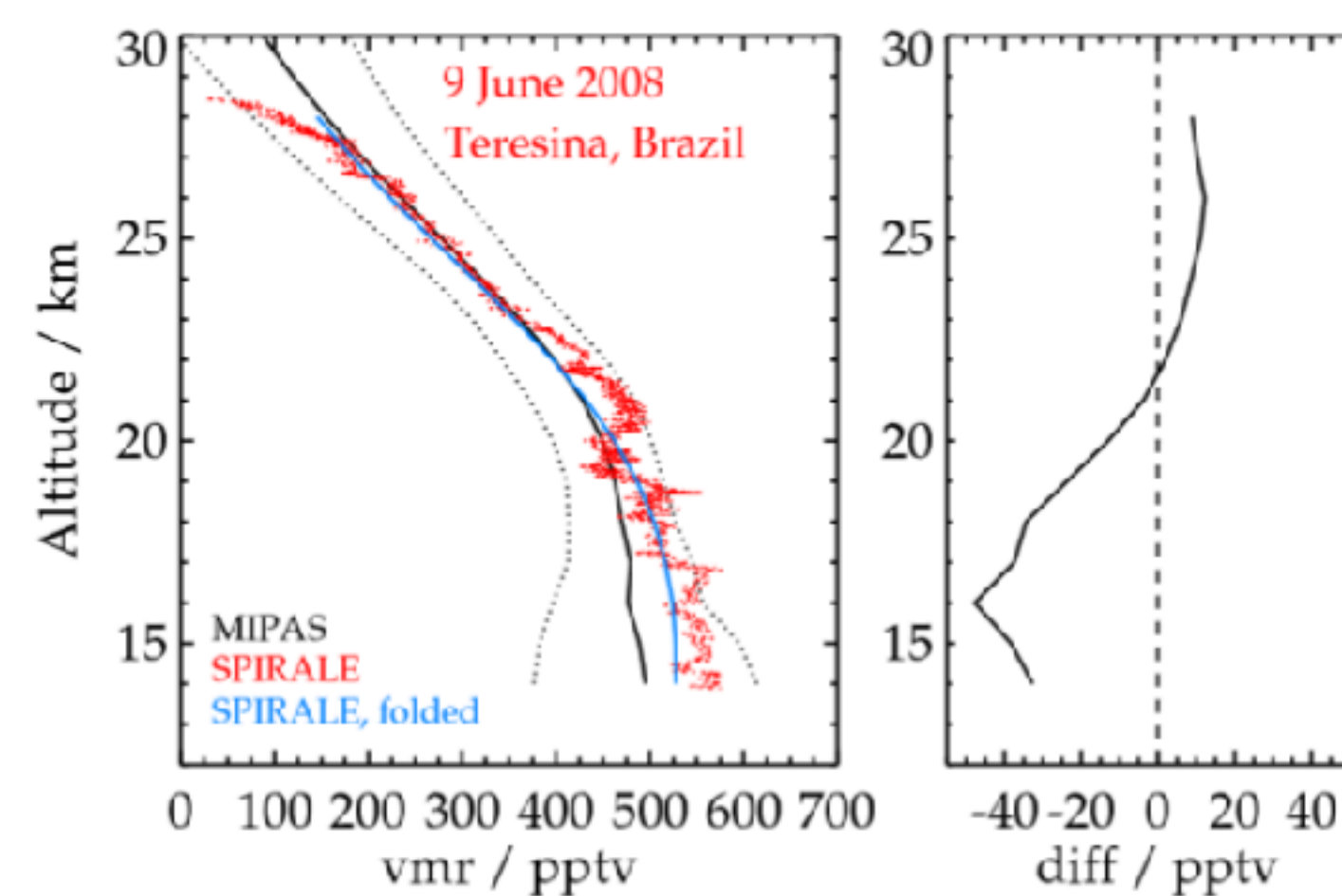
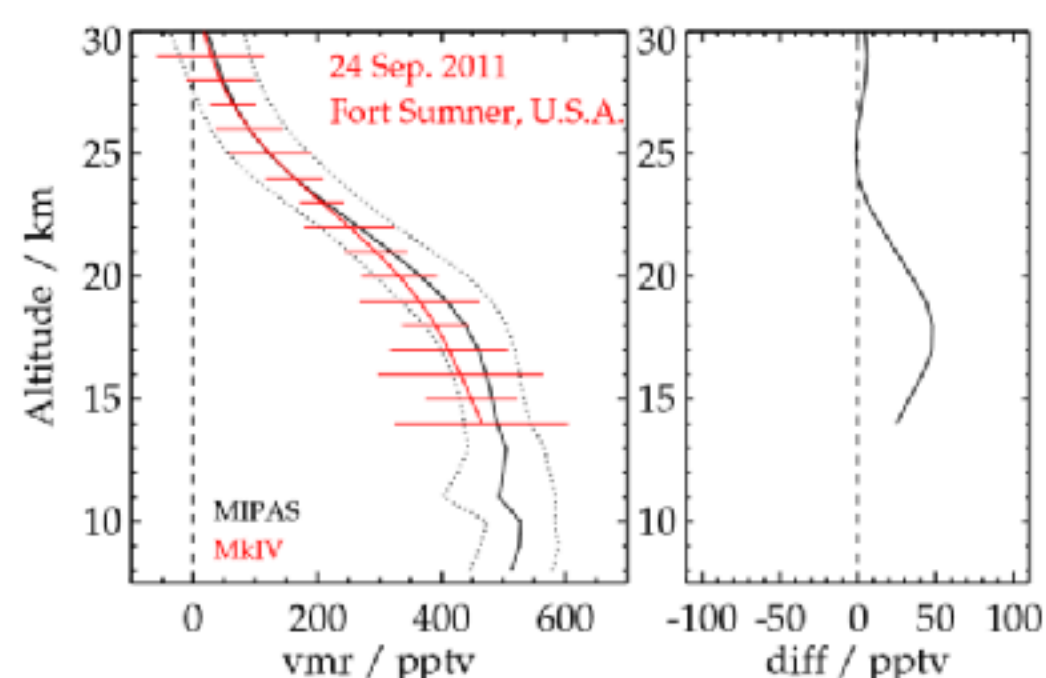
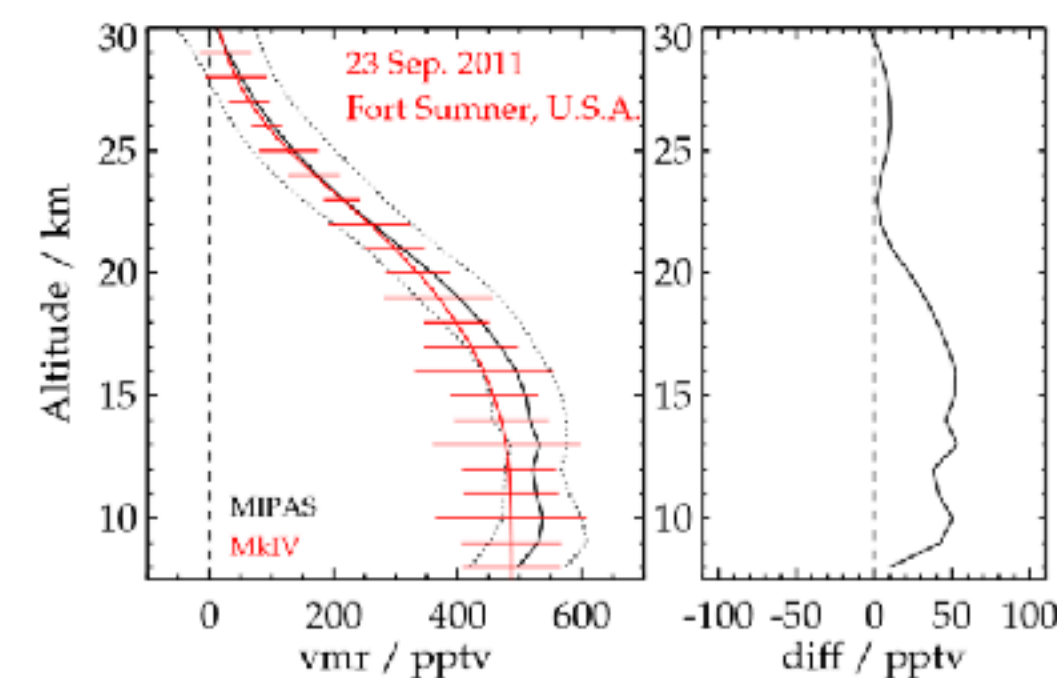
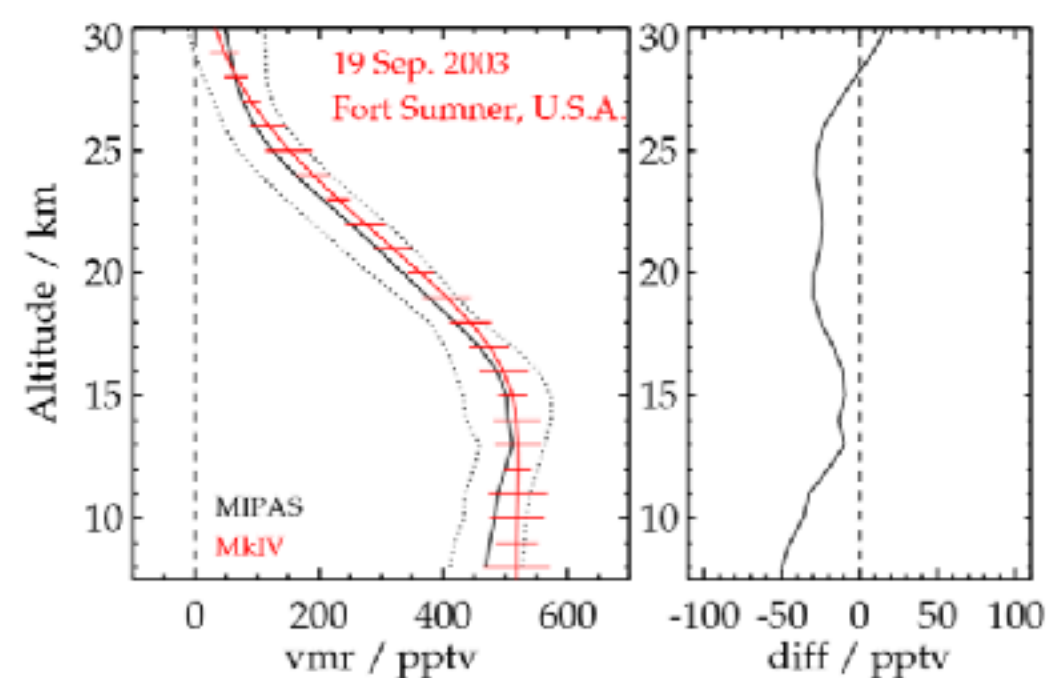
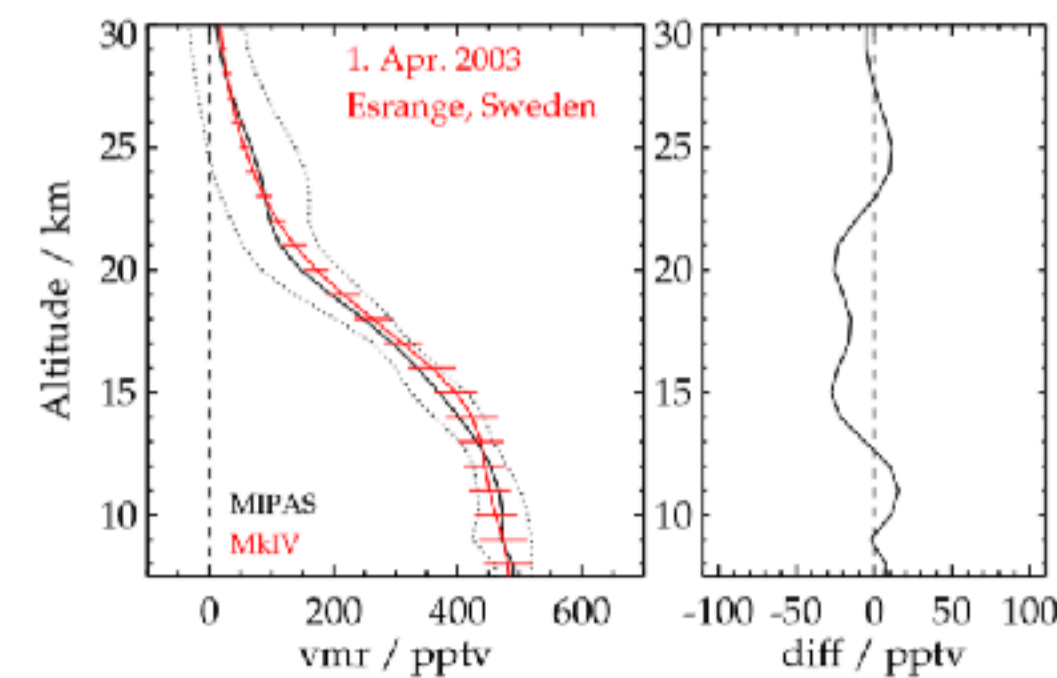
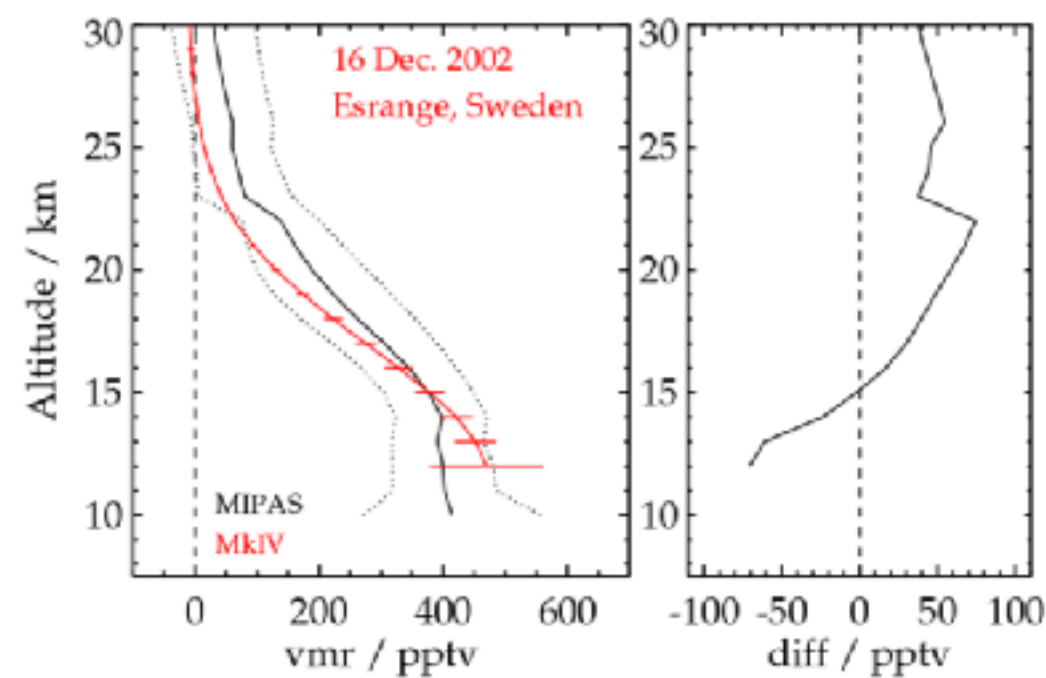


## Global carbonyl sulfide (OCS) measured by MIPAS/Envisat during 2002–2012

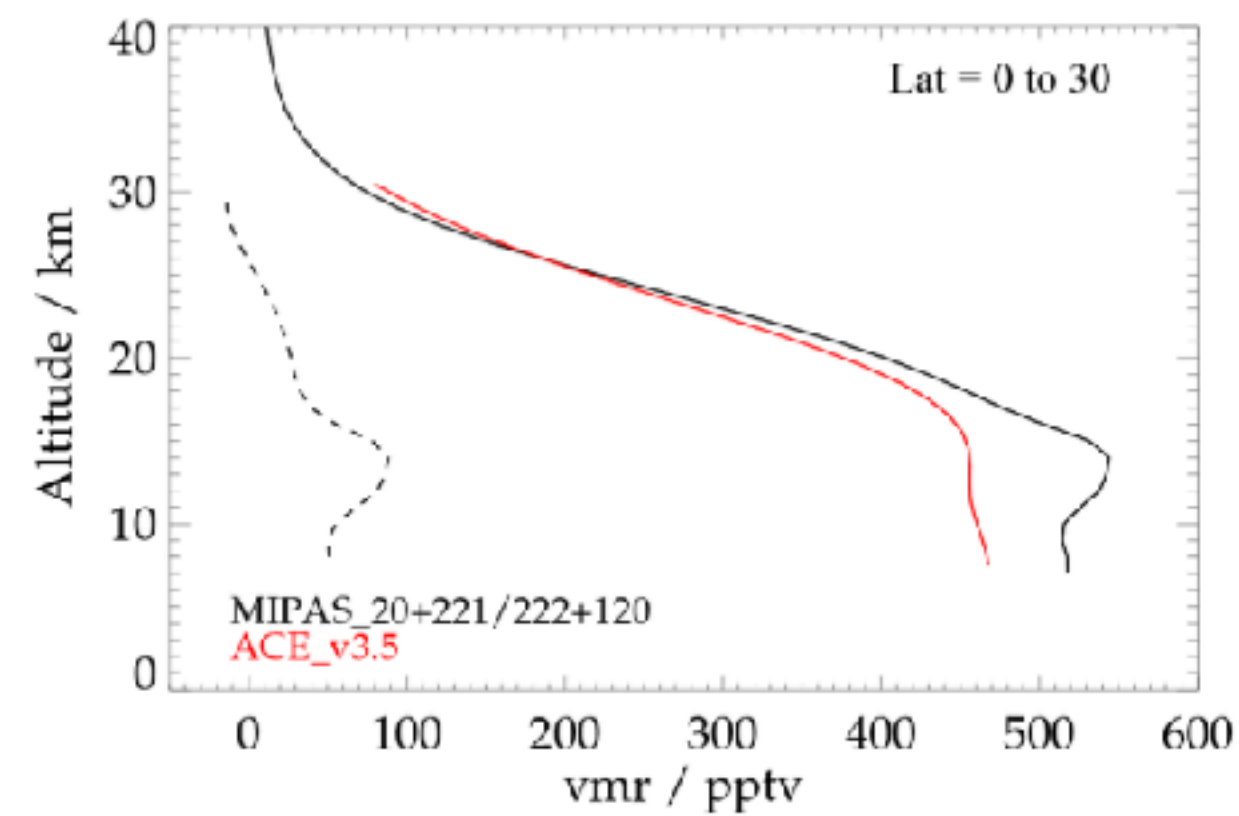
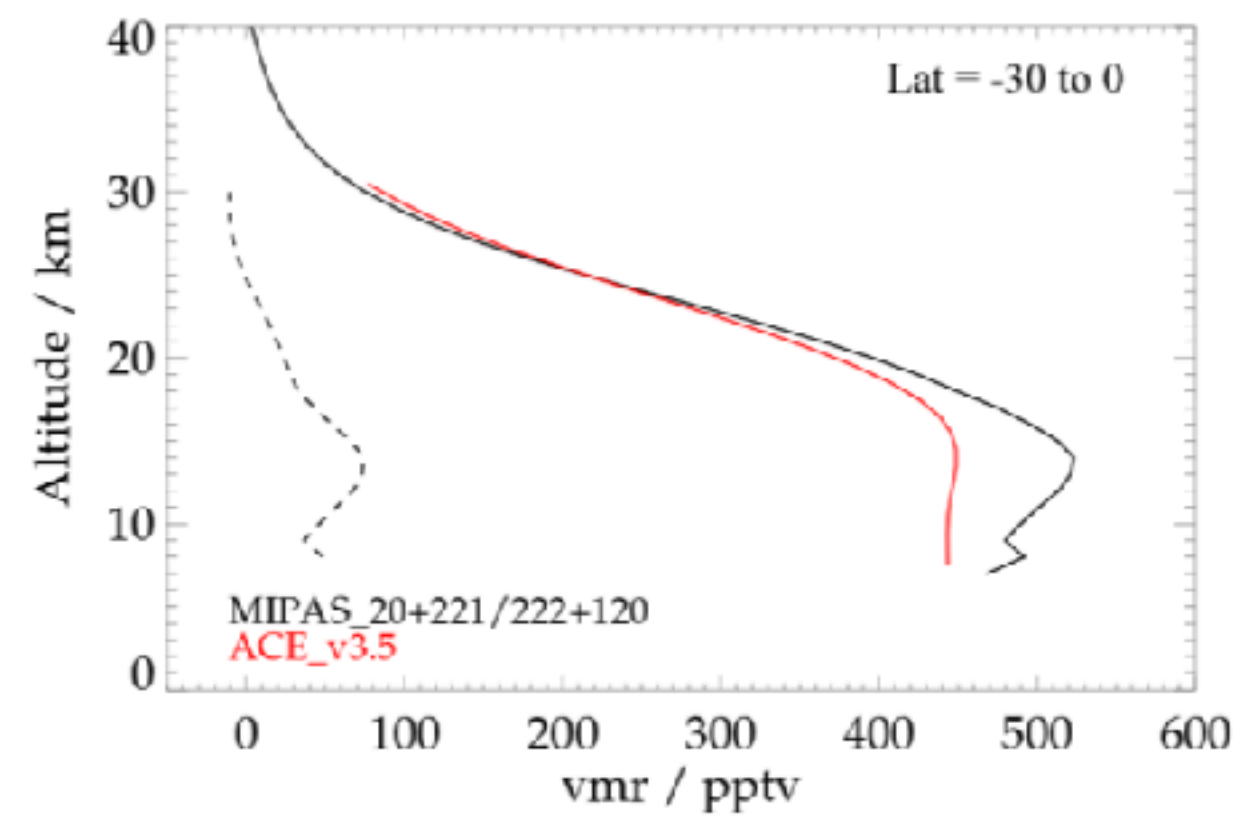
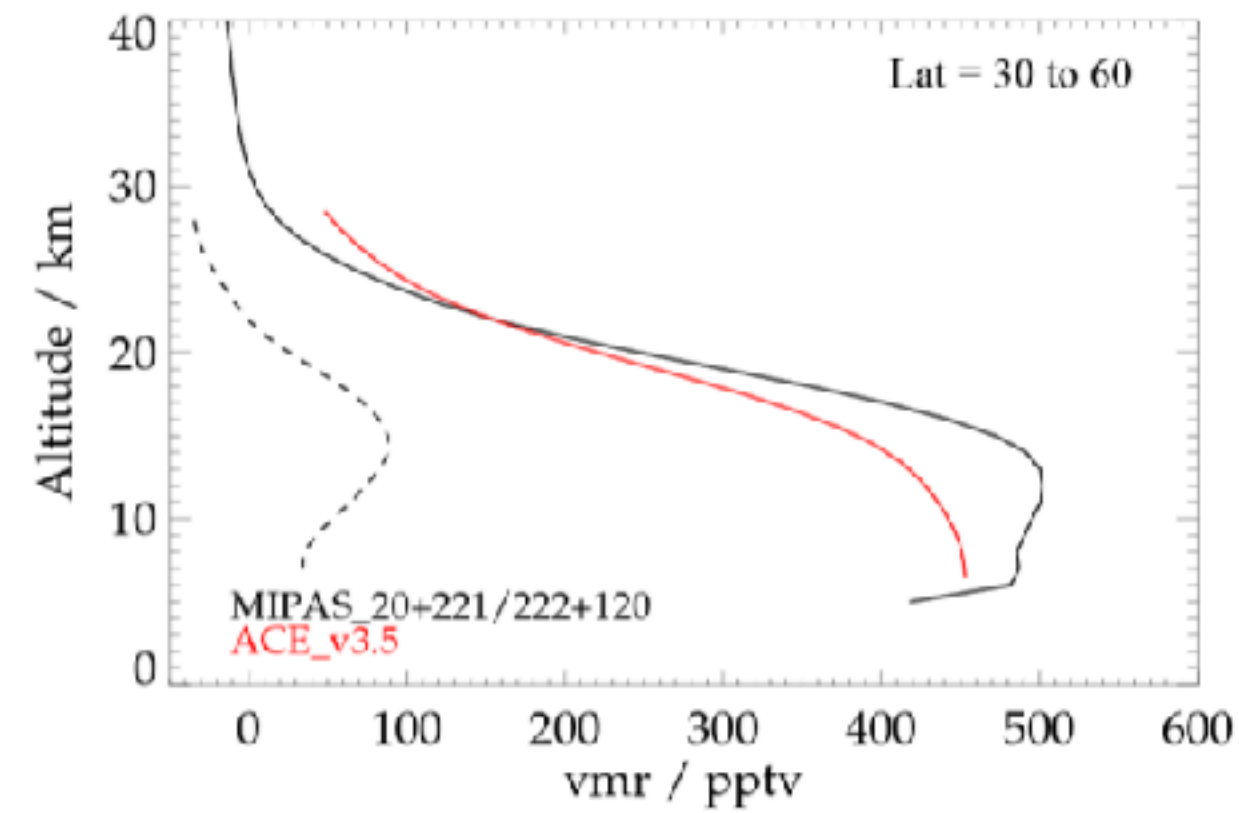
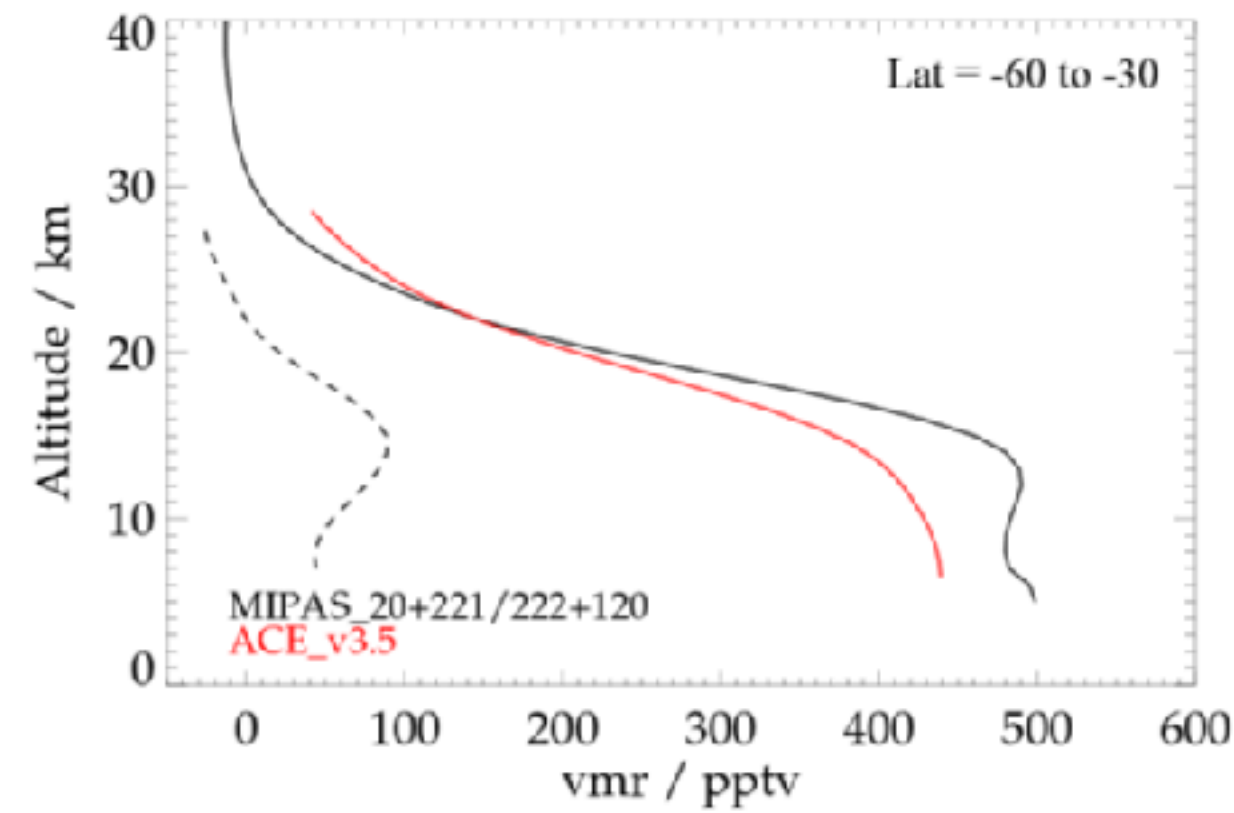
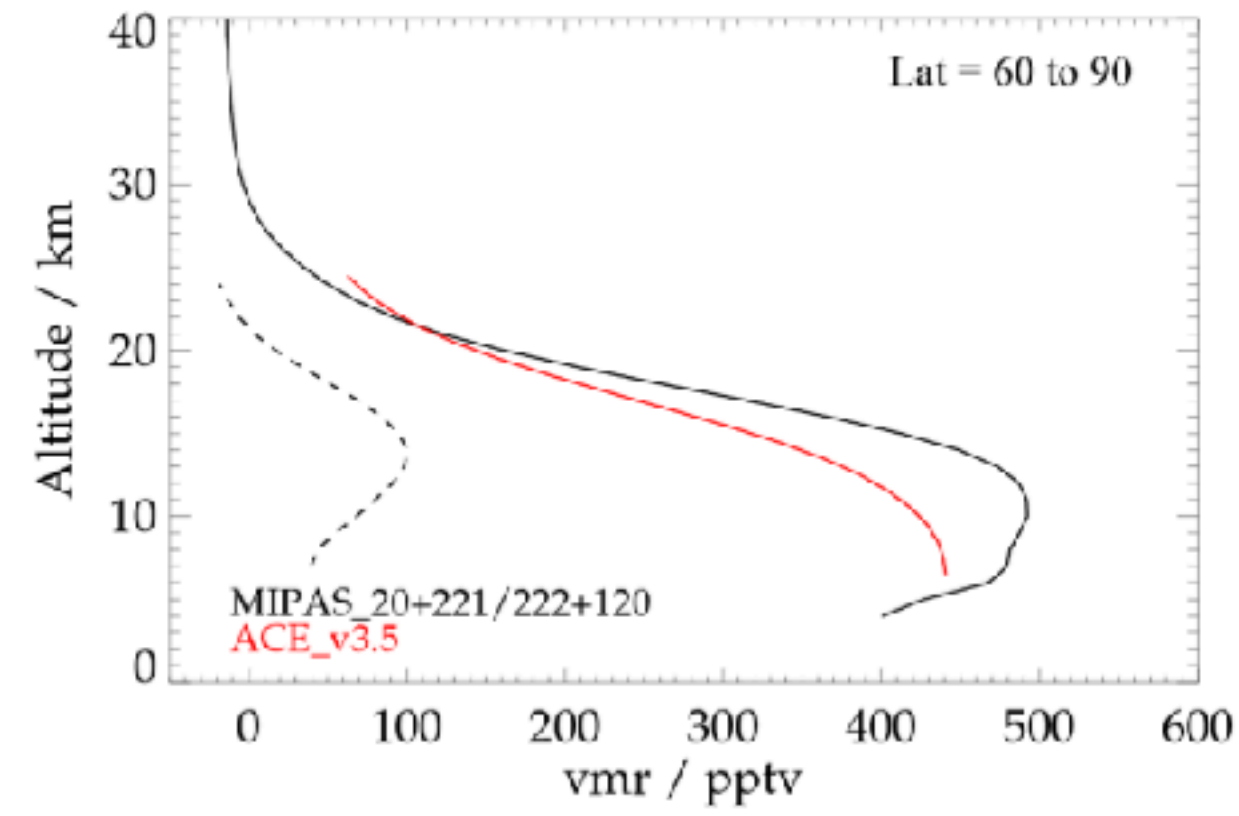
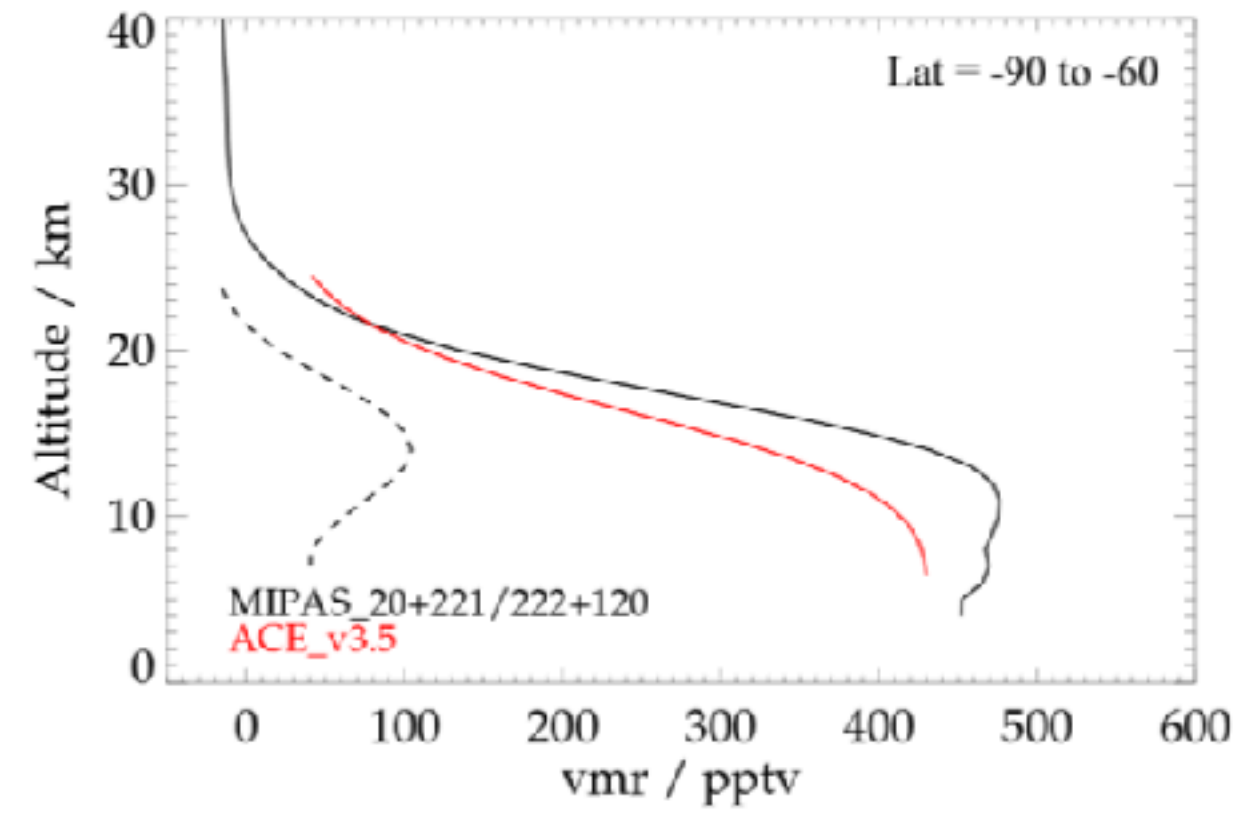
Norbert Glatthor<sup>1</sup>, Michael Höpfner<sup>1</sup>, Adrian Leyser<sup>1,a</sup>, Gabriele P. Stiller<sup>1</sup>, Thomas von Clarmann<sup>1</sup>, Udo Grabowski<sup>1</sup>, Sylvia Kellmann<sup>1</sup>, Andrea Linden<sup>1</sup>, Björn-Martin Sinnhuber<sup>1</sup>, Gisèle Kryzstofiak<sup>2</sup>, and Kaley A. Walker<sup>3</sup>



Estimated error ~50 ppt

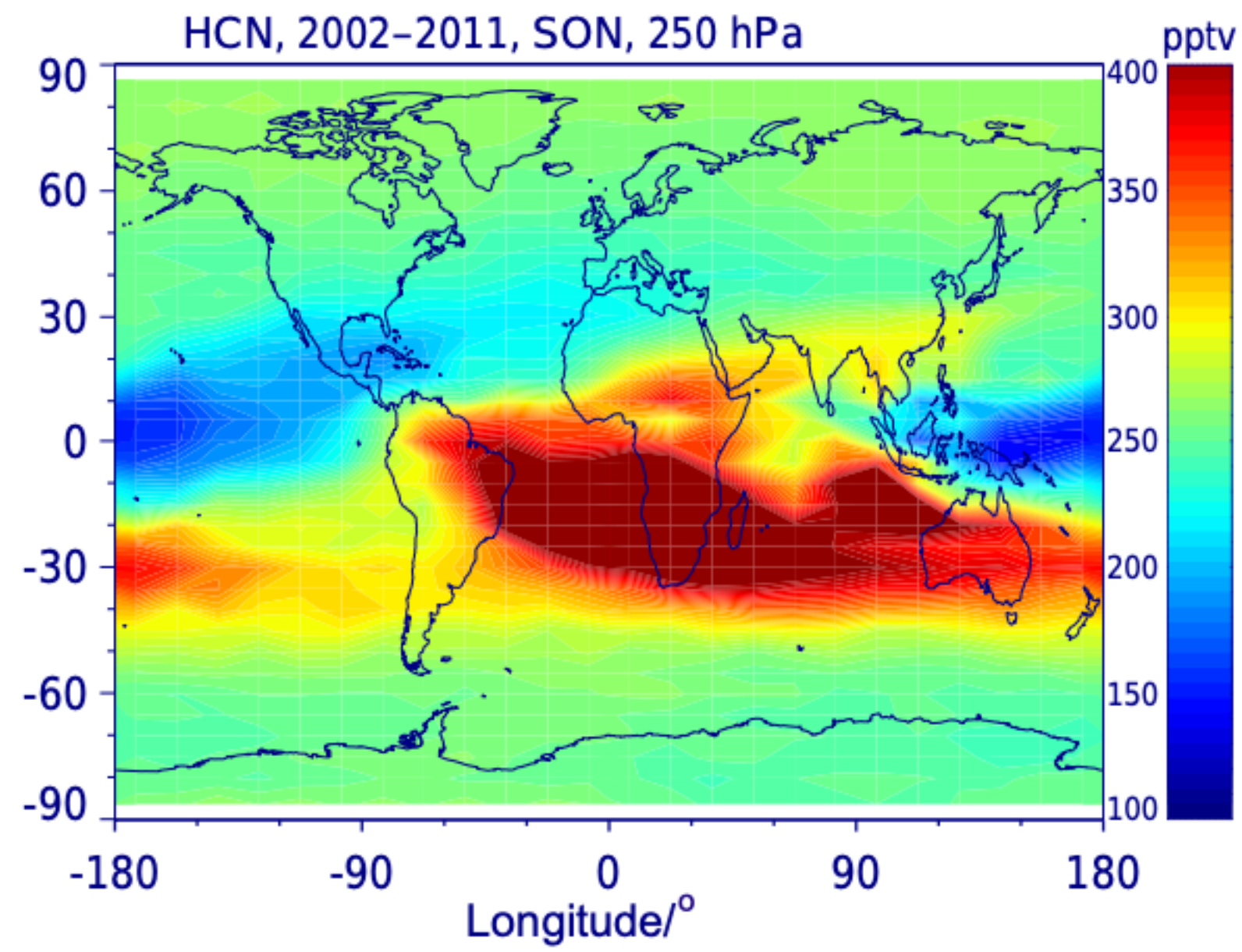
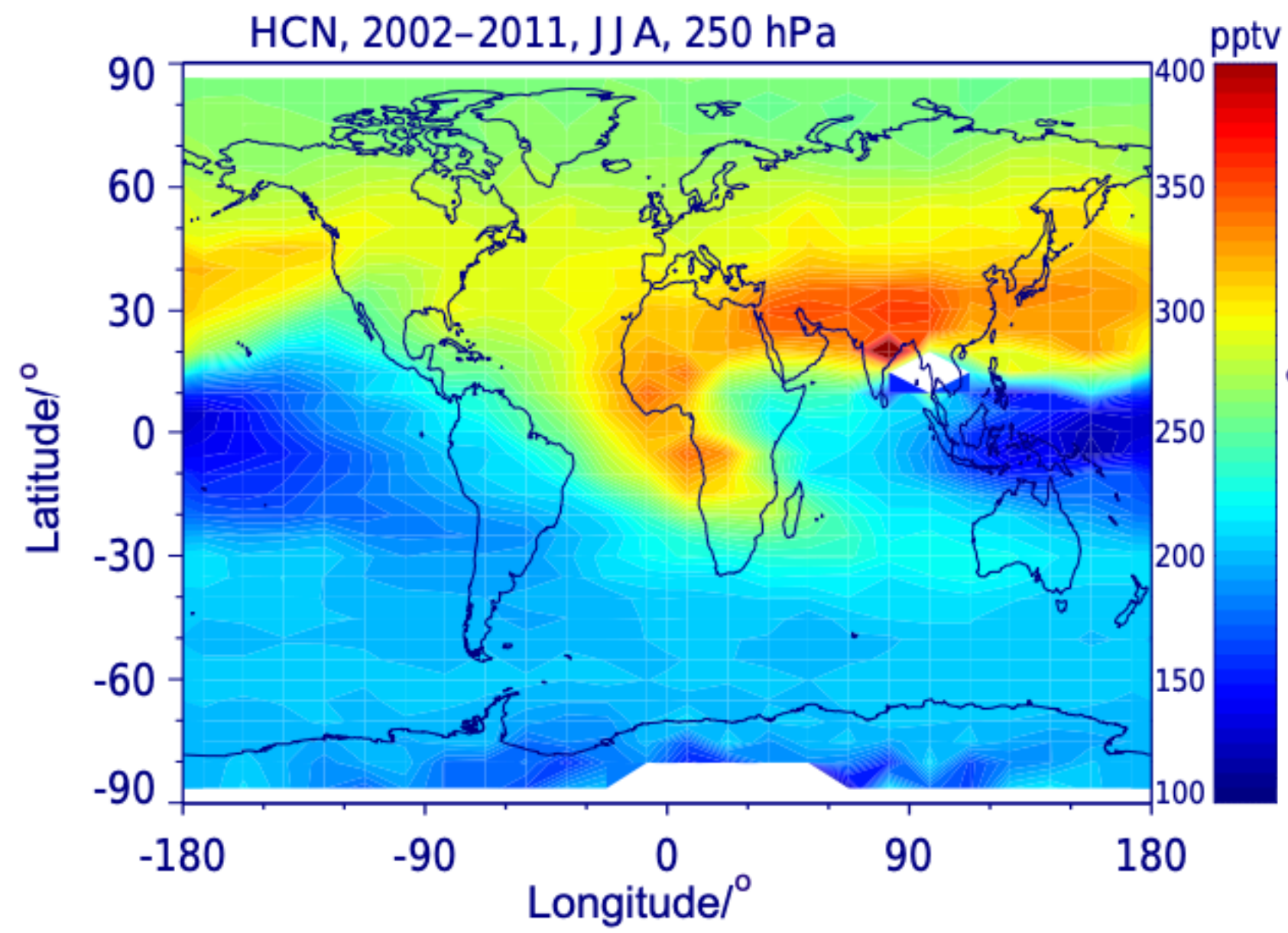
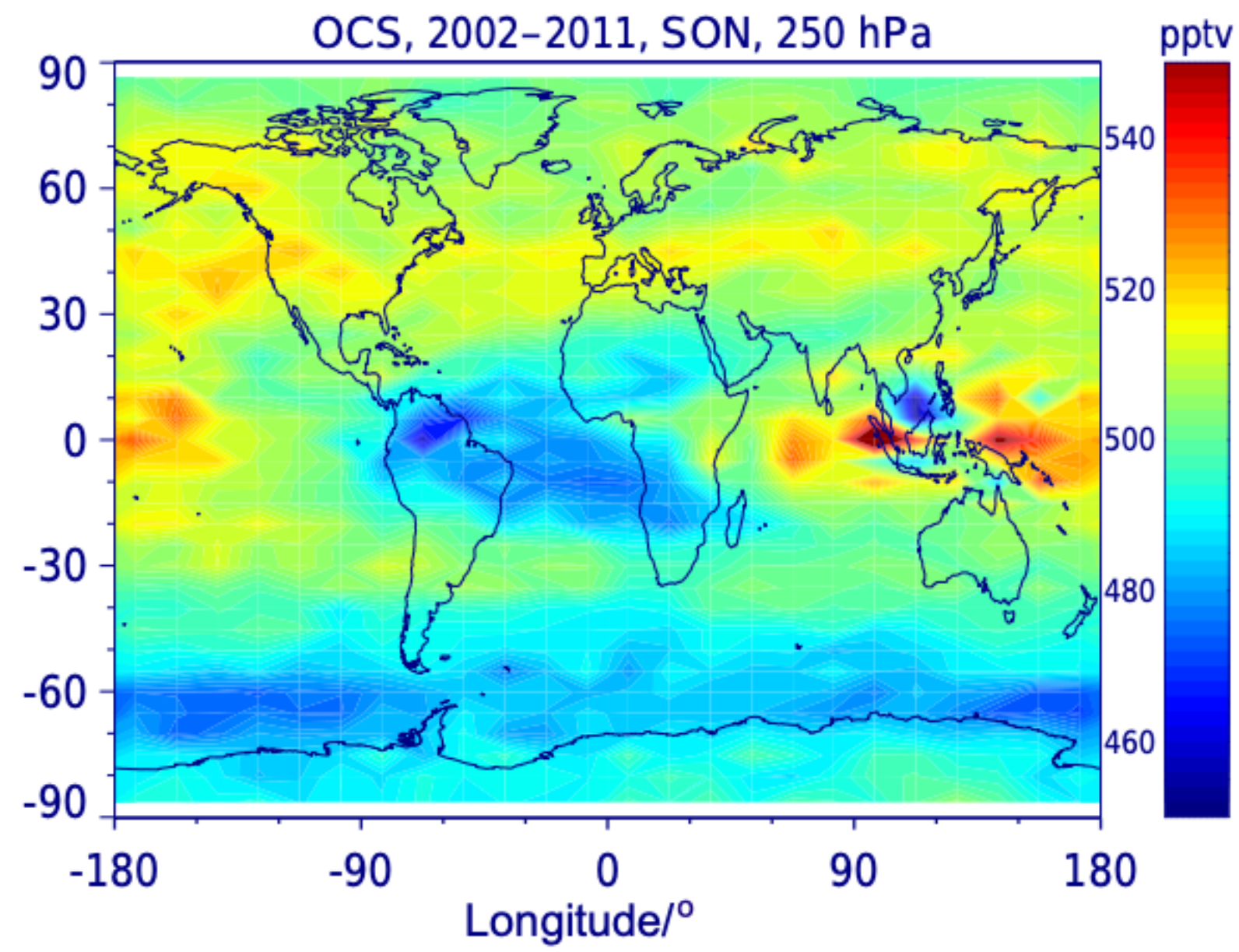
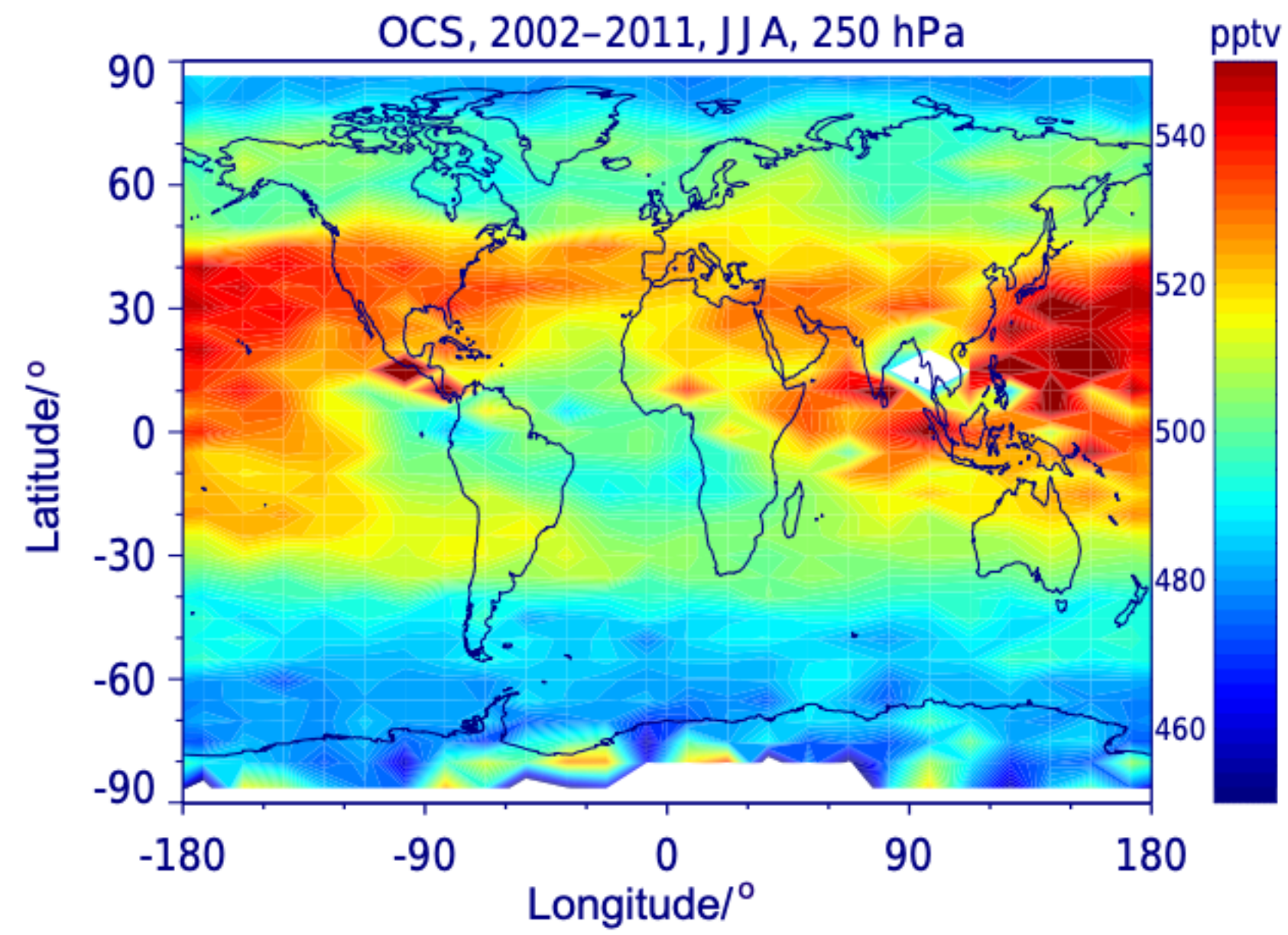






**ACE-FTS < MIPAS**

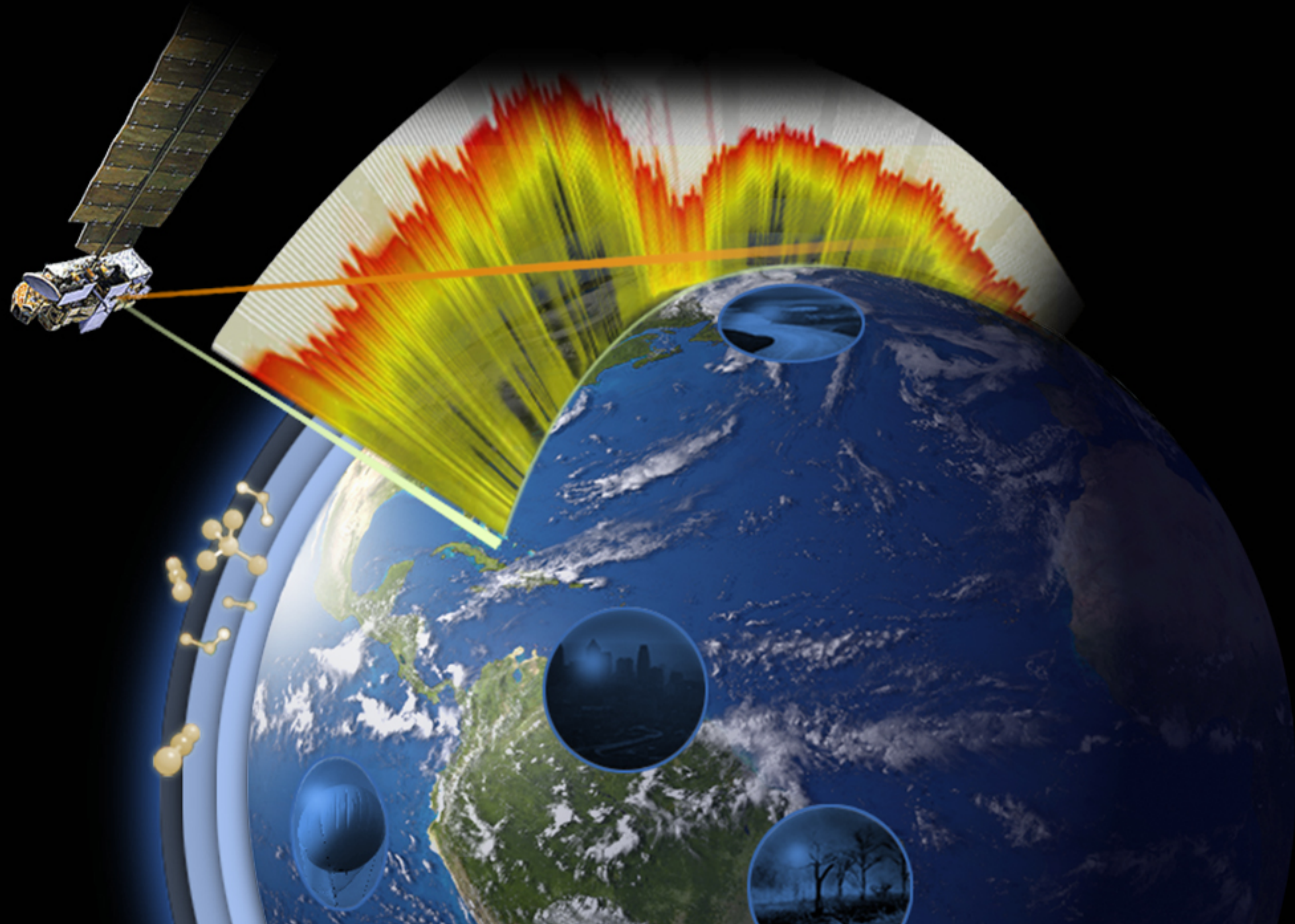




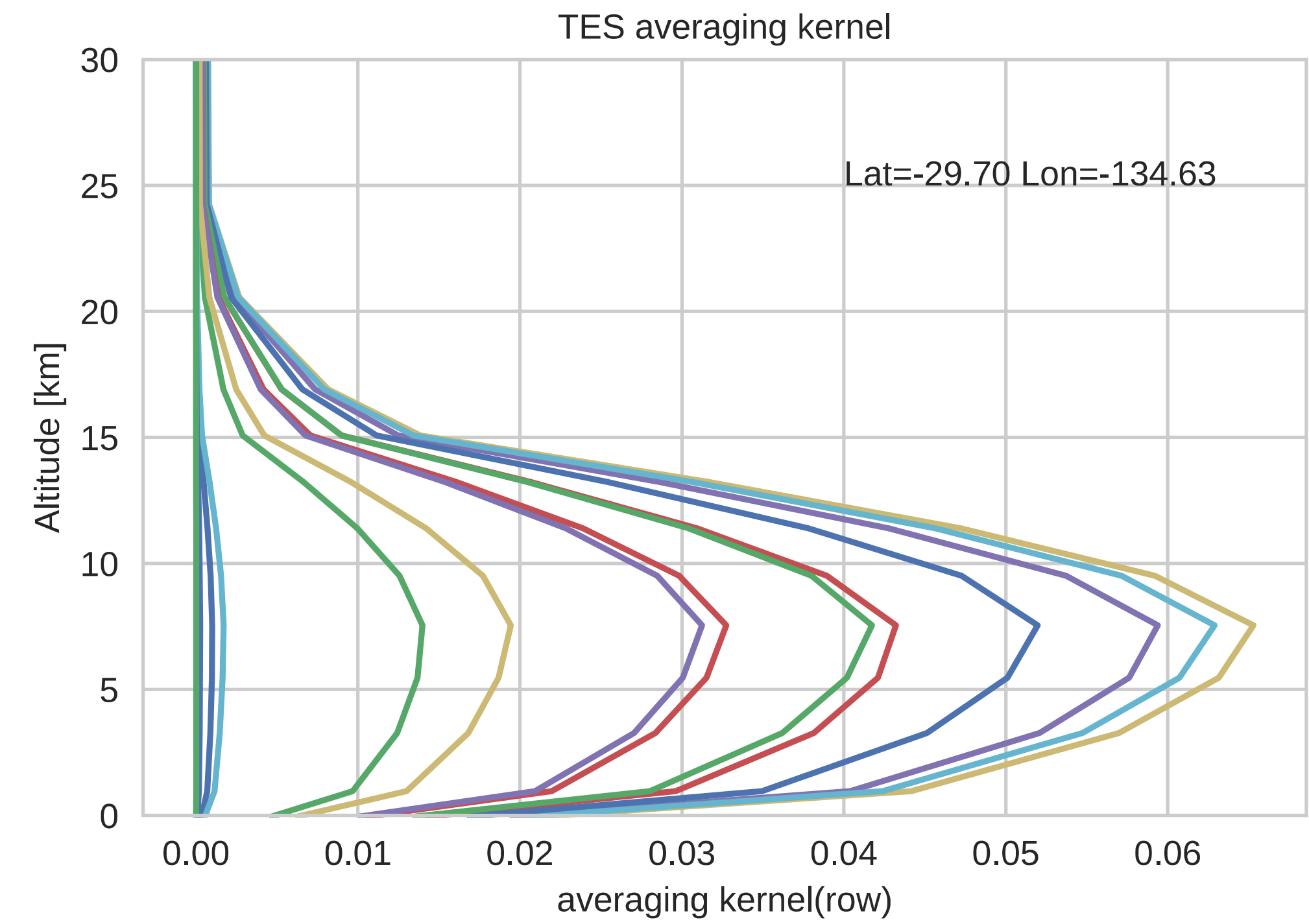
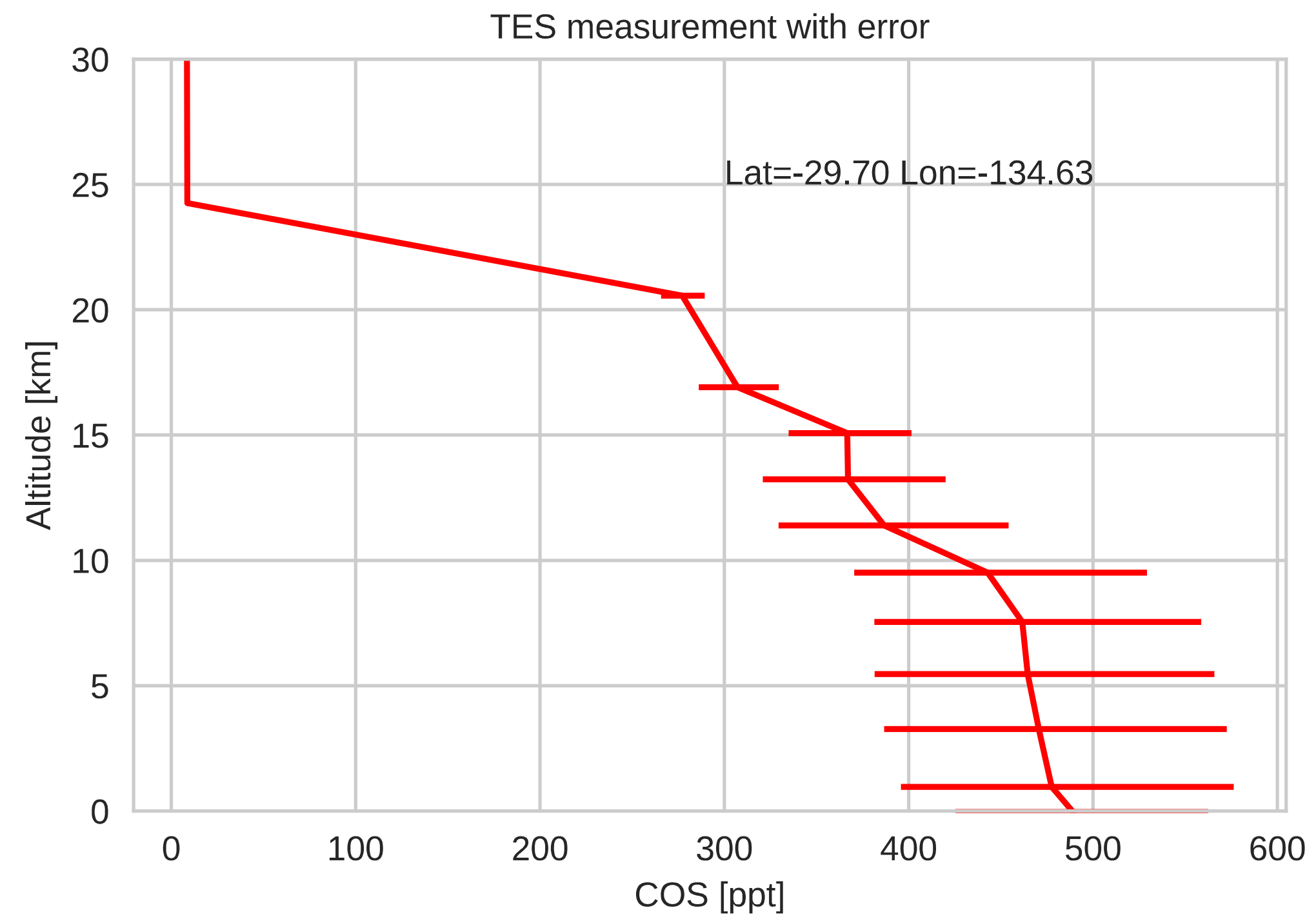
**No sign of strong  
Biomass Burning**



# TES

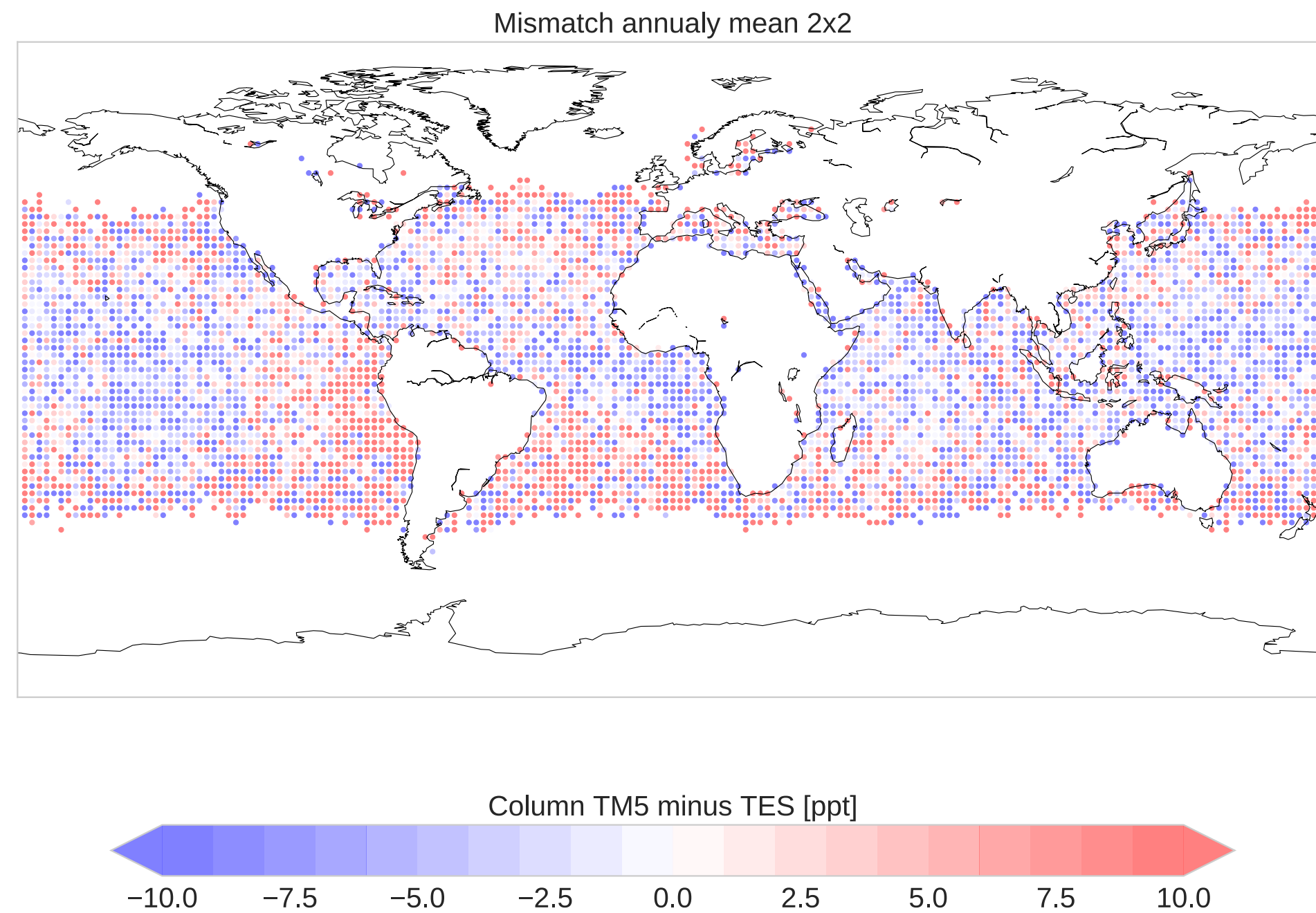




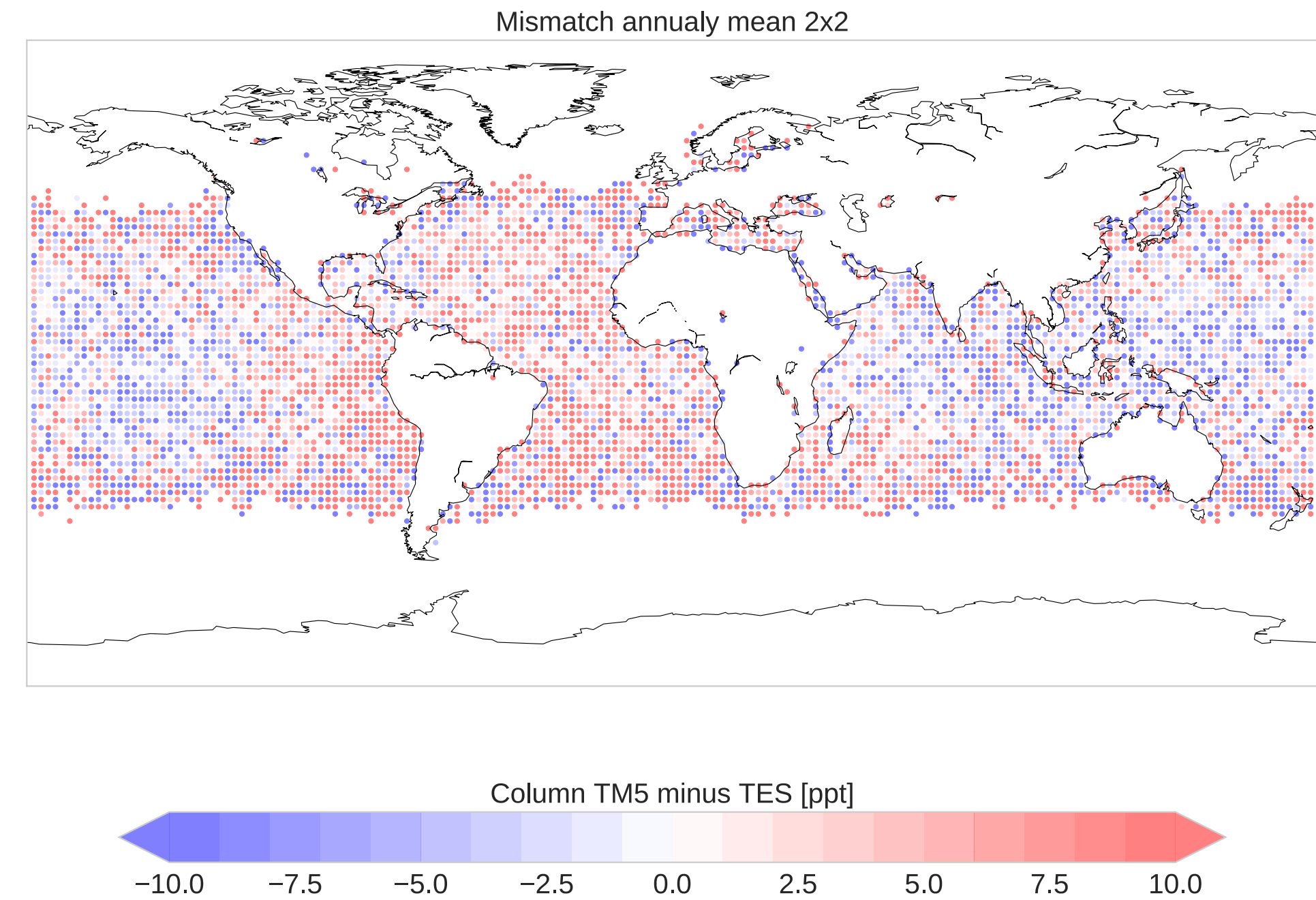




# TM5 Optimised (two flavours) compared to TES



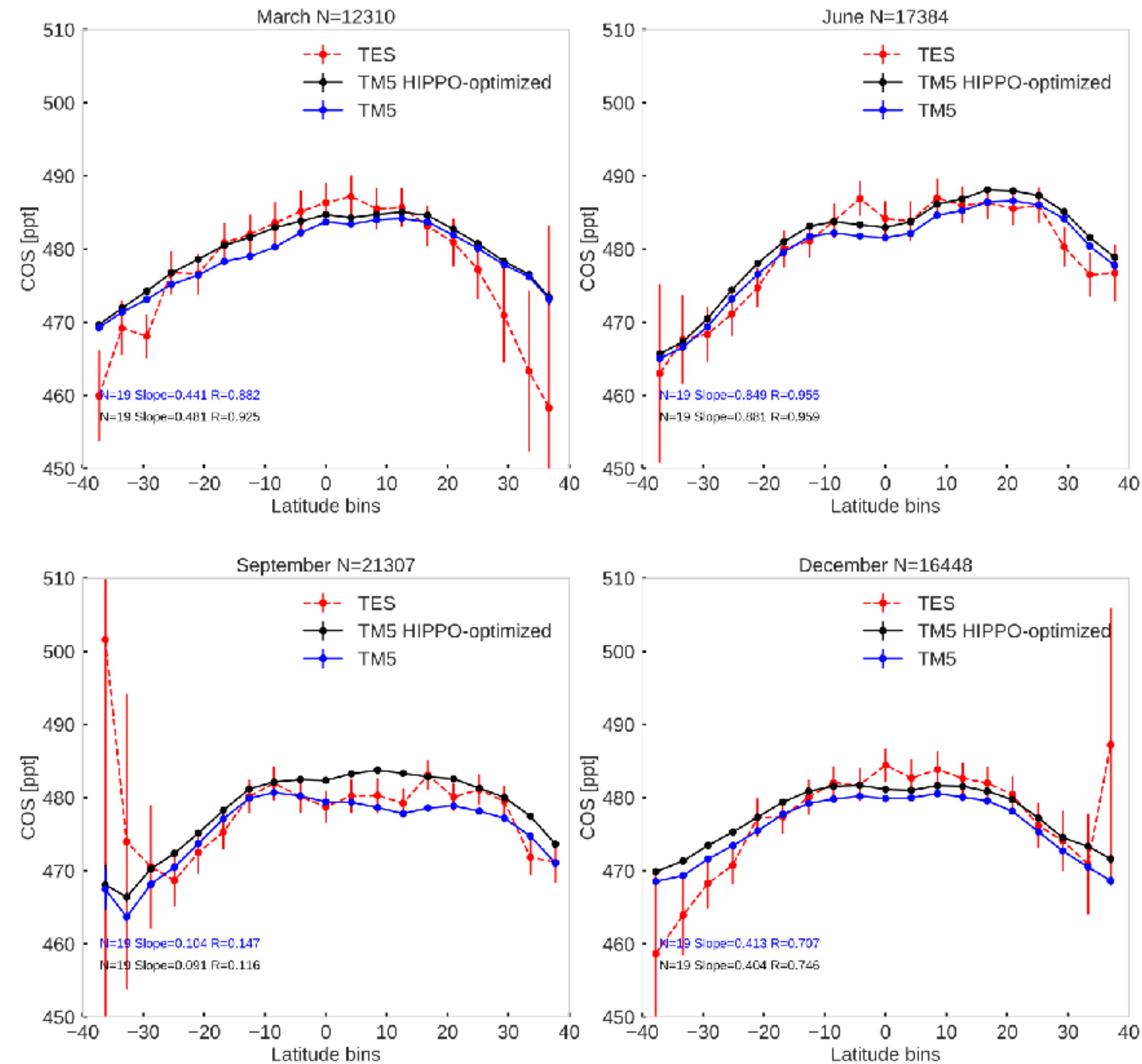
NOAA optimized



NOAA and HIPPO optimized



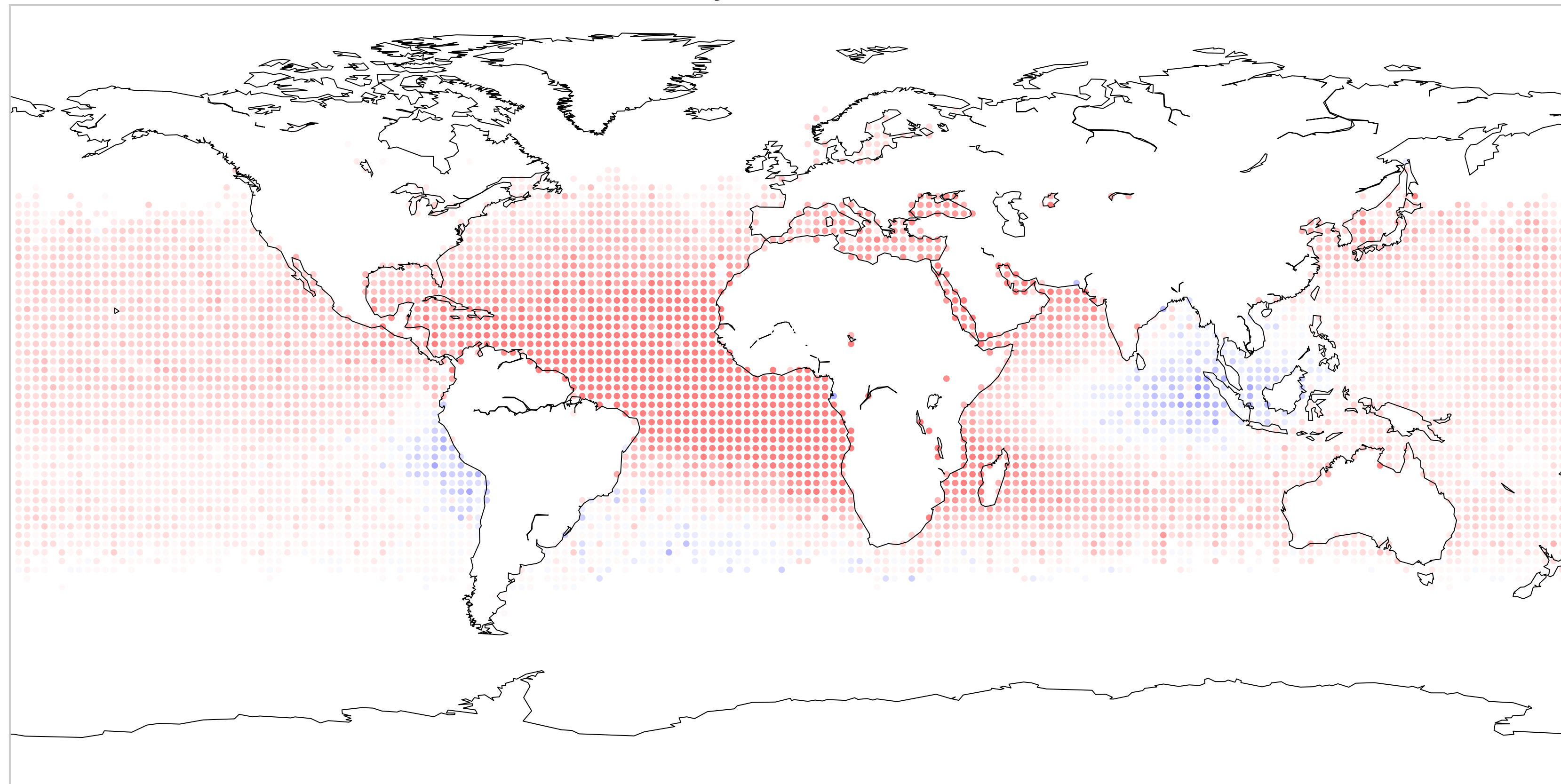
# TM5 Optimised (two flavours) compared to TES



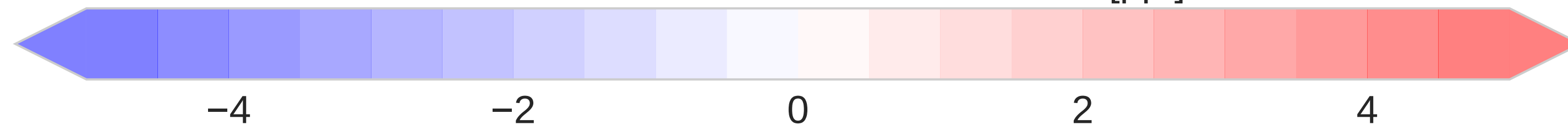


# Impact of HIPPO on the posterior TES columns

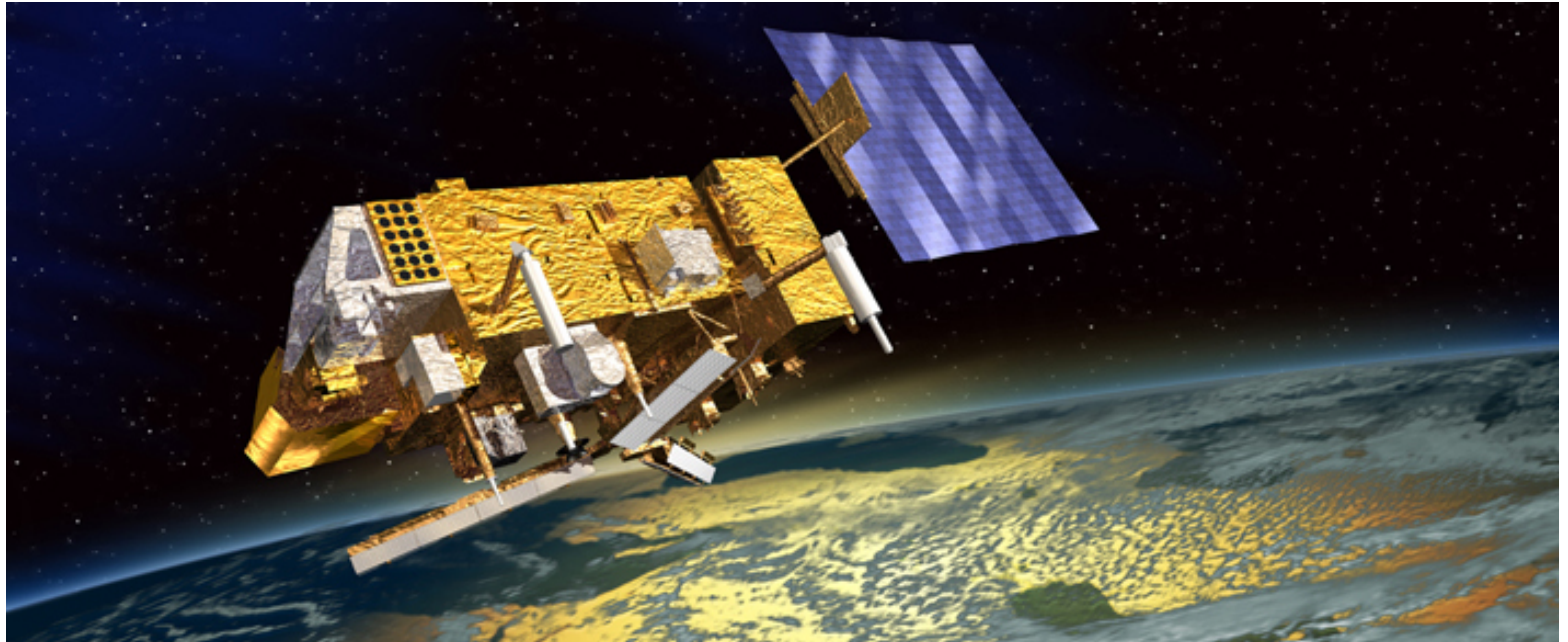
TM5 annually mean difference 2x2



Column TM5 difference between 2 runs [ppt]



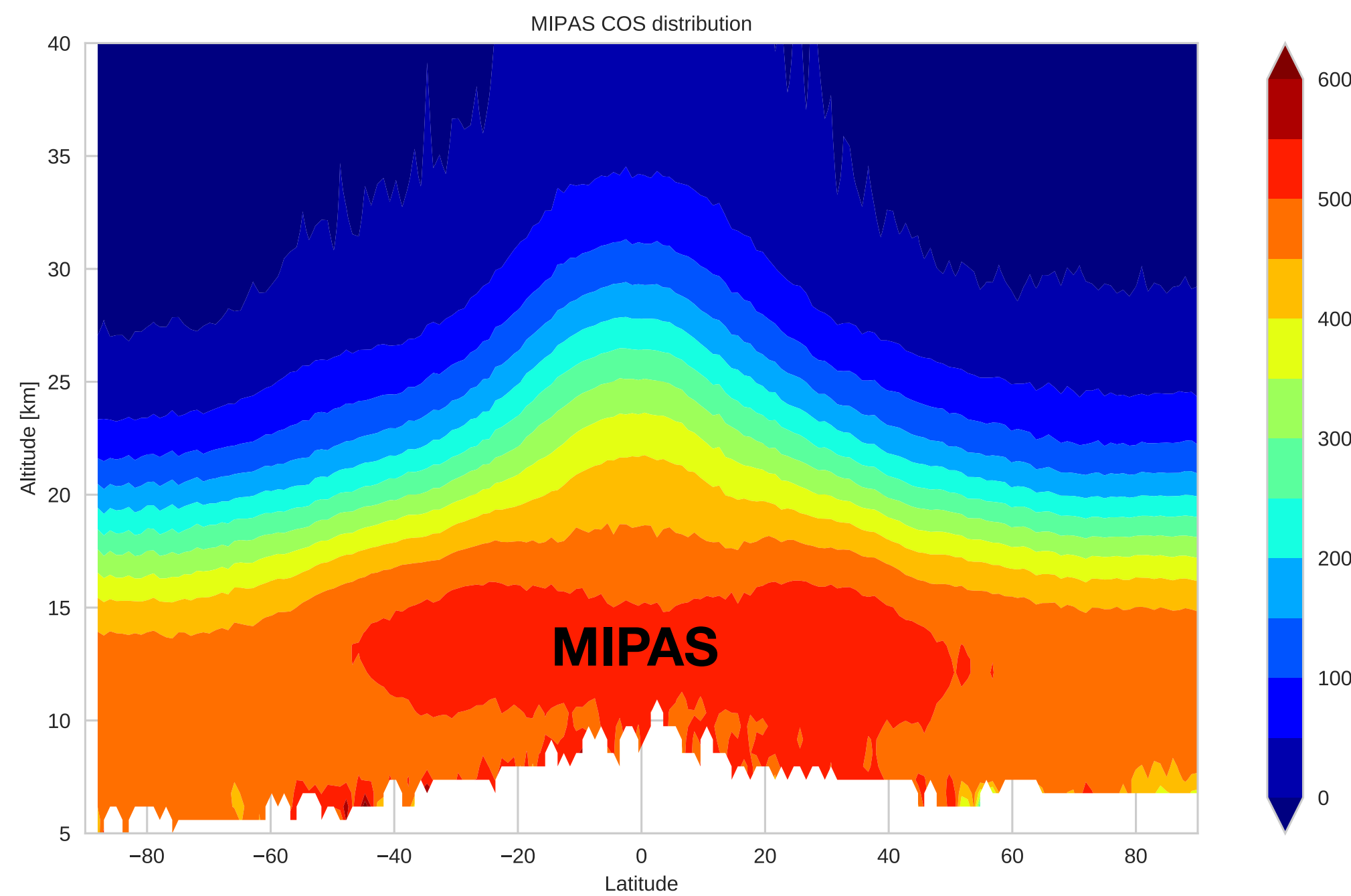




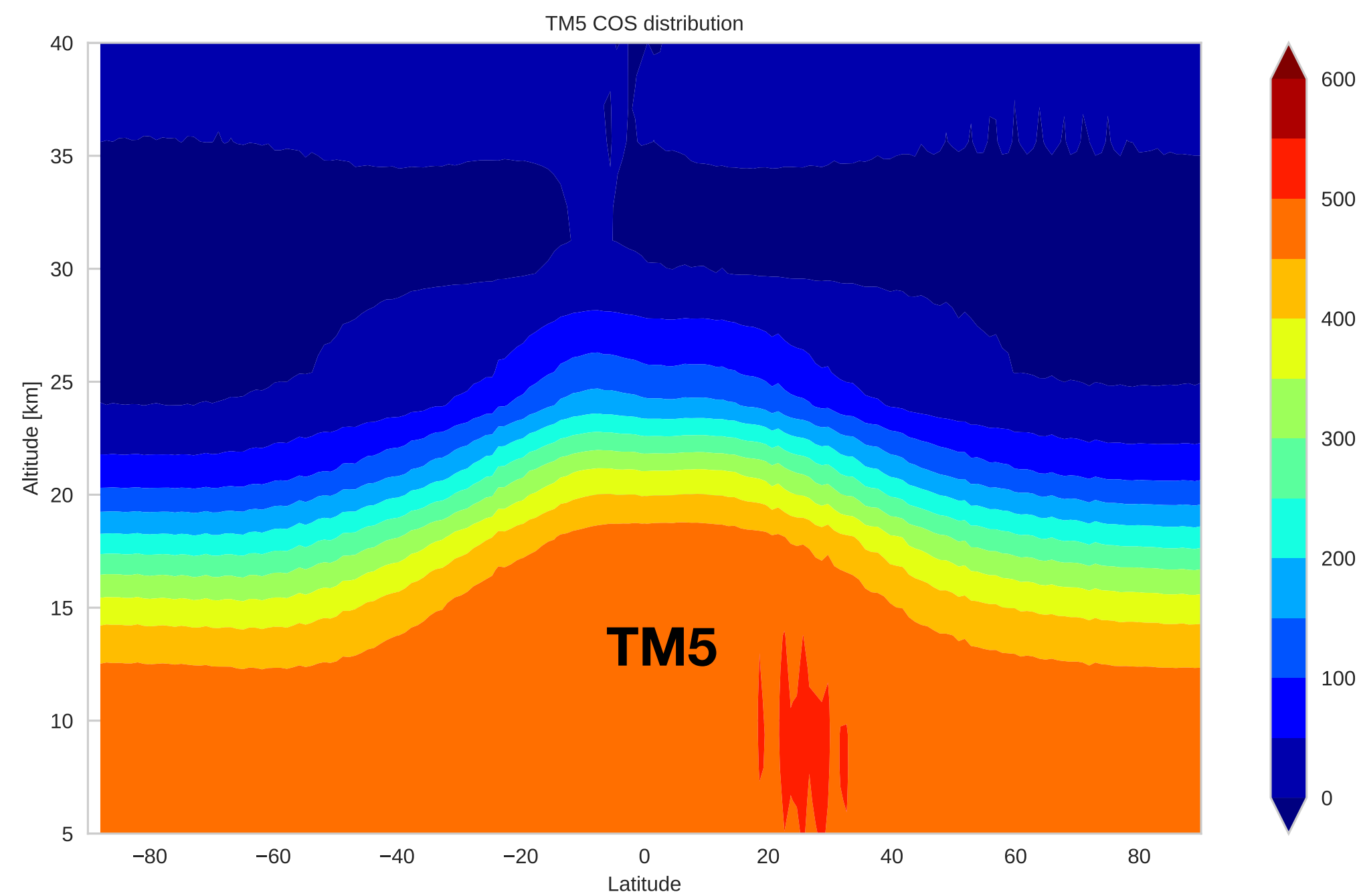
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0- 30 N



30 - 60 N

60 - 90 N

