



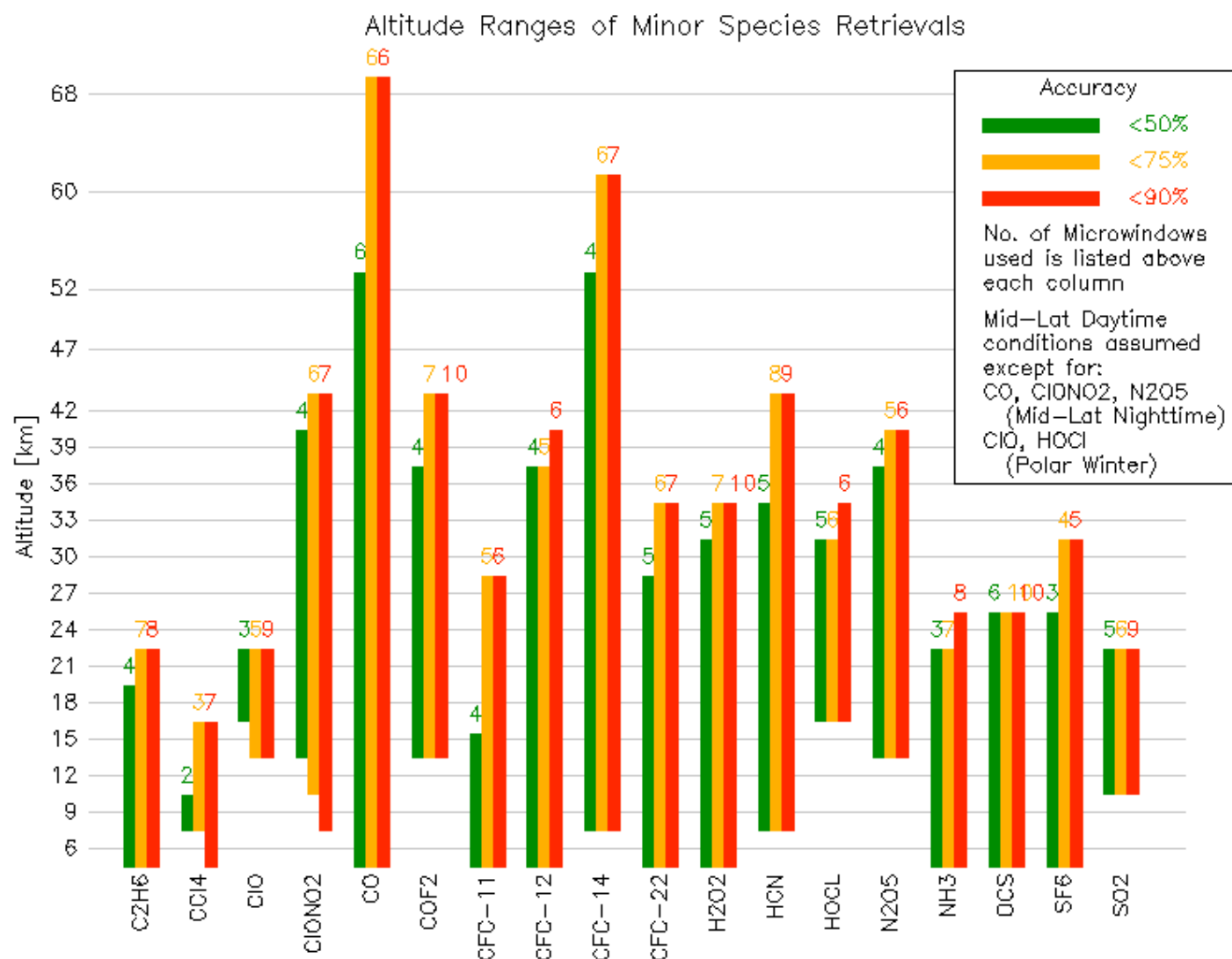
# Recent Updates on Microwindows and Occupation Matrices

# Occupation Matrices

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& Planetary Physics,  
University of Oxford



- ❖ OMs define both the MWs to be used and the retrieval range
- ❖ Previously: microwindows selected for for 18 minor species (in addition to key species)
- ❖ Now: 3 OMs per species for nominal mode
  - max error 50% ('safe')
  - max error 75%
  - max error 90% ('dangerous')



# Special Modes

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Mode	Description	Altitude Range [km]	Vertical Resl. [km]	Spectral Resl. [cm <sup>-1</sup> ]
<b>S1</b>	Polar Chem.& Dynamics	7-55	2	0.025
<b>S2</b>	Trop/Strat Exchange	5-40	1.5	0.025
<b>S3</b>	Aircraft Emissions	6-40	1.5	0.025
<b>S4</b>	Stratospheric Dynamics	8-53	3	0.1
<b>S5</b>	Diurnal Changes	15-60	3	0.025
<b>S6</b>	Upper Trop/Lower Strat	6-35	2	0.1

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# S2/S3 Modes

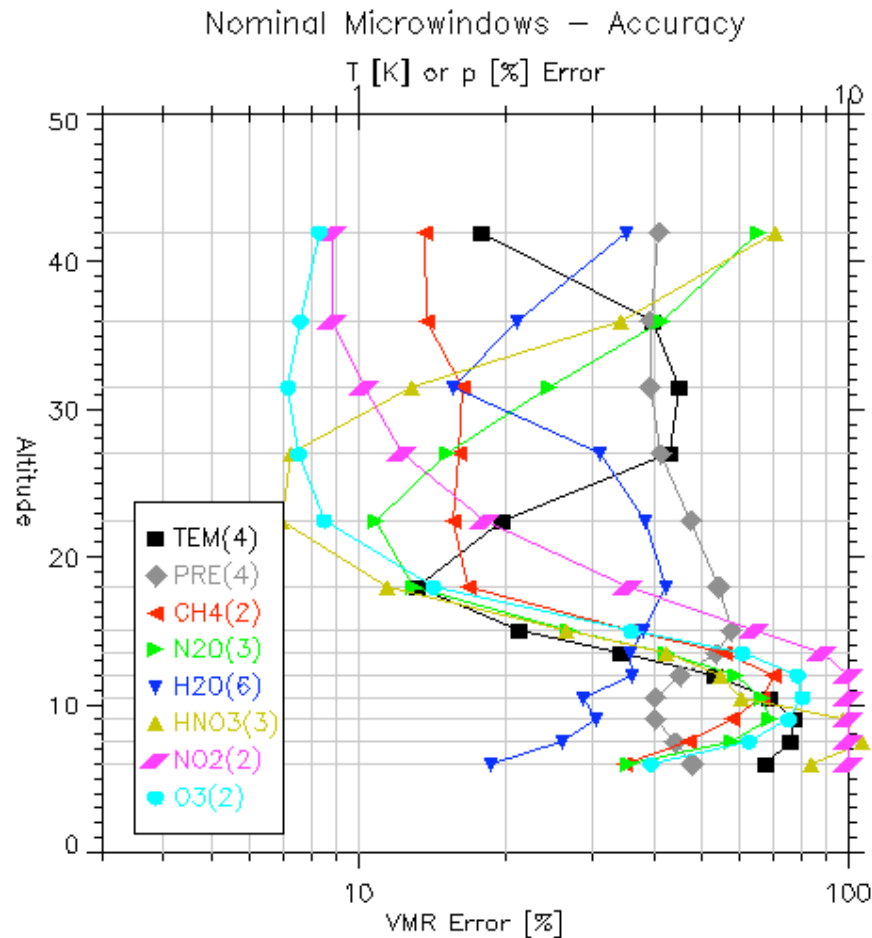
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- ❖ High vertical sampling (1.5km) significantly reduces S/N (reduced Jacobians) if retrieval is attempted at all tangent points
- ❖ Previously: selected occupation matrices for these modes using only *existing* microwindows (originally selected for 3km sampling).
  - poor retrieval accuracy

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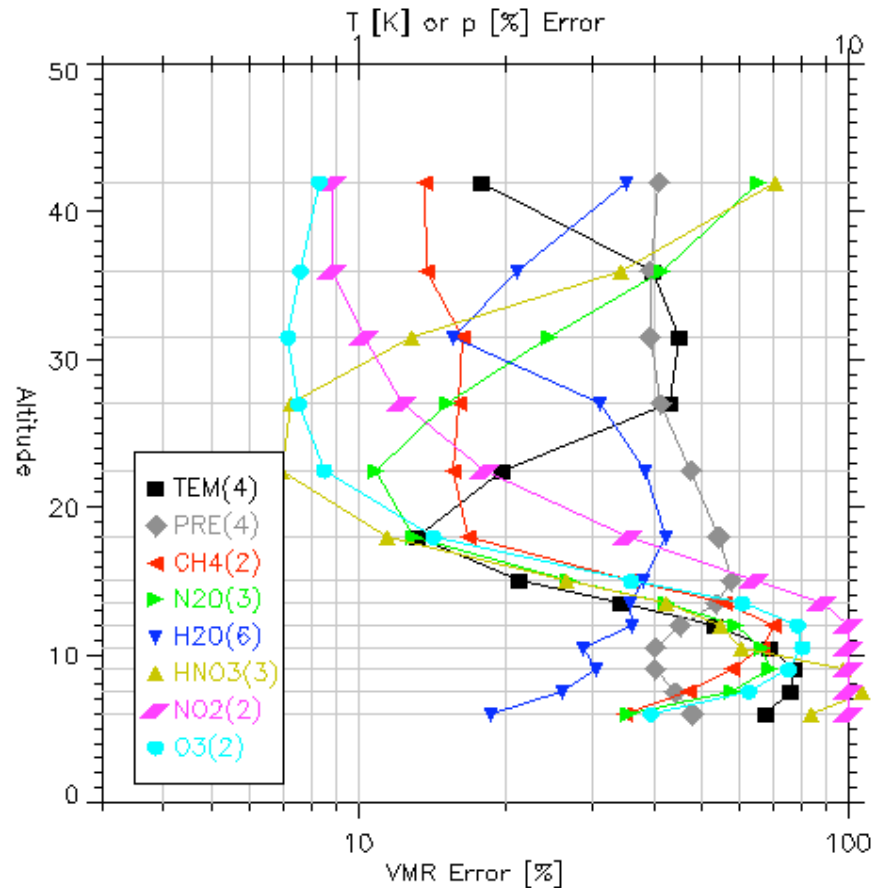
- ❖ High vertical sampling (1.5km) significantly reduces S/N (reduced Jacobians) if retrieval is attempted at all tangent points
- ❖ Previously: selected occupation matrices for these modes using only *existing* microwindows (originally selected for 3km sampling).
  - poor retrieval accuracy
- ❖ Now: selected microwindows specifically for this vertical sampling to see if performance improves



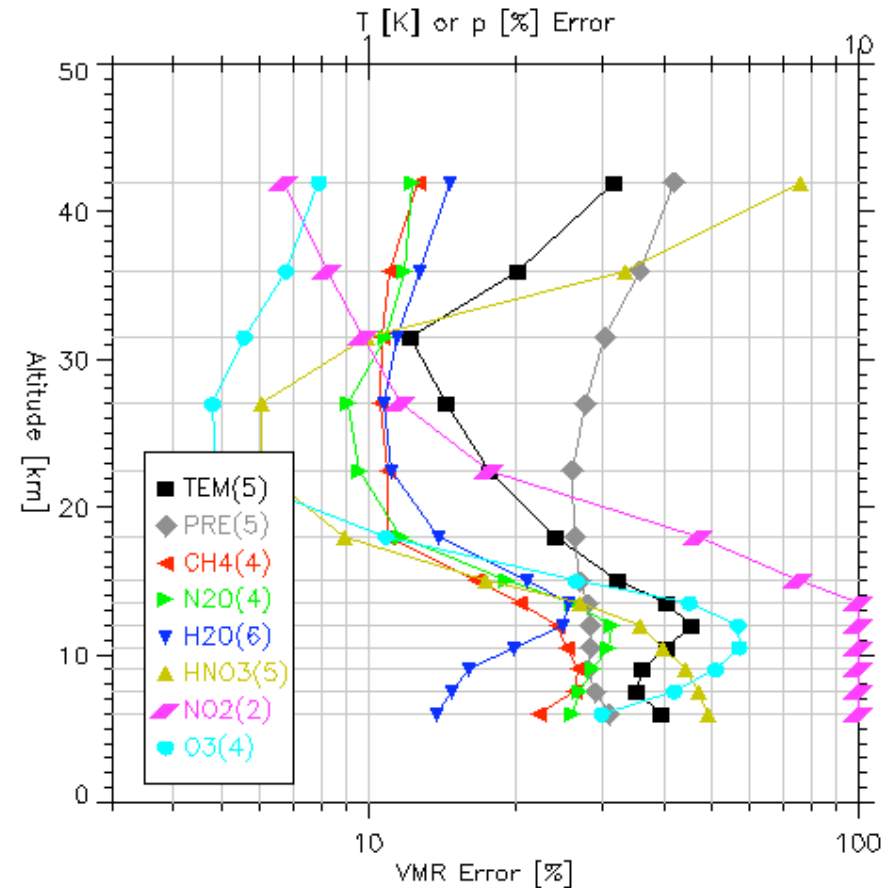
# S2/S3 Modes



Nominal Microwindows – Accuracy



S2/S3 Specific Microwindows – Accuracy





## Conclusions

- ❖ Expect significant improvement in 1.5km sampling special modes if new dedicated microwindows are used
- ❖ But: not yet clear whether temperature retrieval will be sufficiently accurate