

# UV AND IR FOURIER TRANSFORM MEASUREMENTS OF ATMOSPHERIC SPECIES

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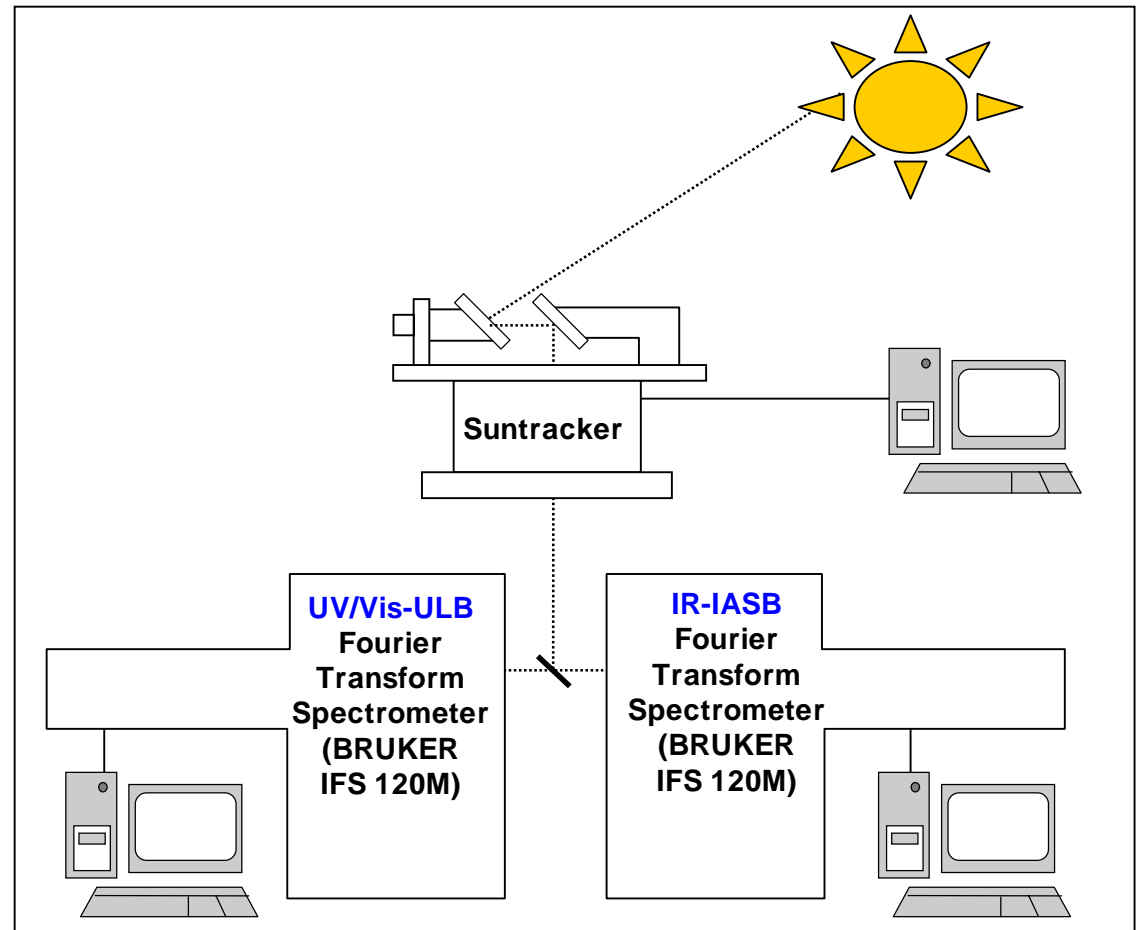
## ✓ Context & Objectives

- ❖ Validation tests for ACE (2003) and IASI (2005) satellite missions
- ❖ Study of some NDSC target molecules :  
Brussels = complementary NDSC station  
FTIR-IASB spectrometer = NDSC candidate
- ❖ Intercomparison of IR and UV / Vis measurements

## ✓ Experimental

IR & UV-VIS FT  
solar absorption spectroscopy

+ TPU & O<sub>3</sub> soundings (0-30  
km) by RMI twice a week



## ✓ Results

❖ IR: CH<sub>4</sub>, N<sub>2</sub>O, HCl

Test as NDSC target molecules

❖ IR : O<sub>3</sub>

Retrievals & independent data (sondes, Dobson) comparison

❖ VIS: H<sub>2</sub>O

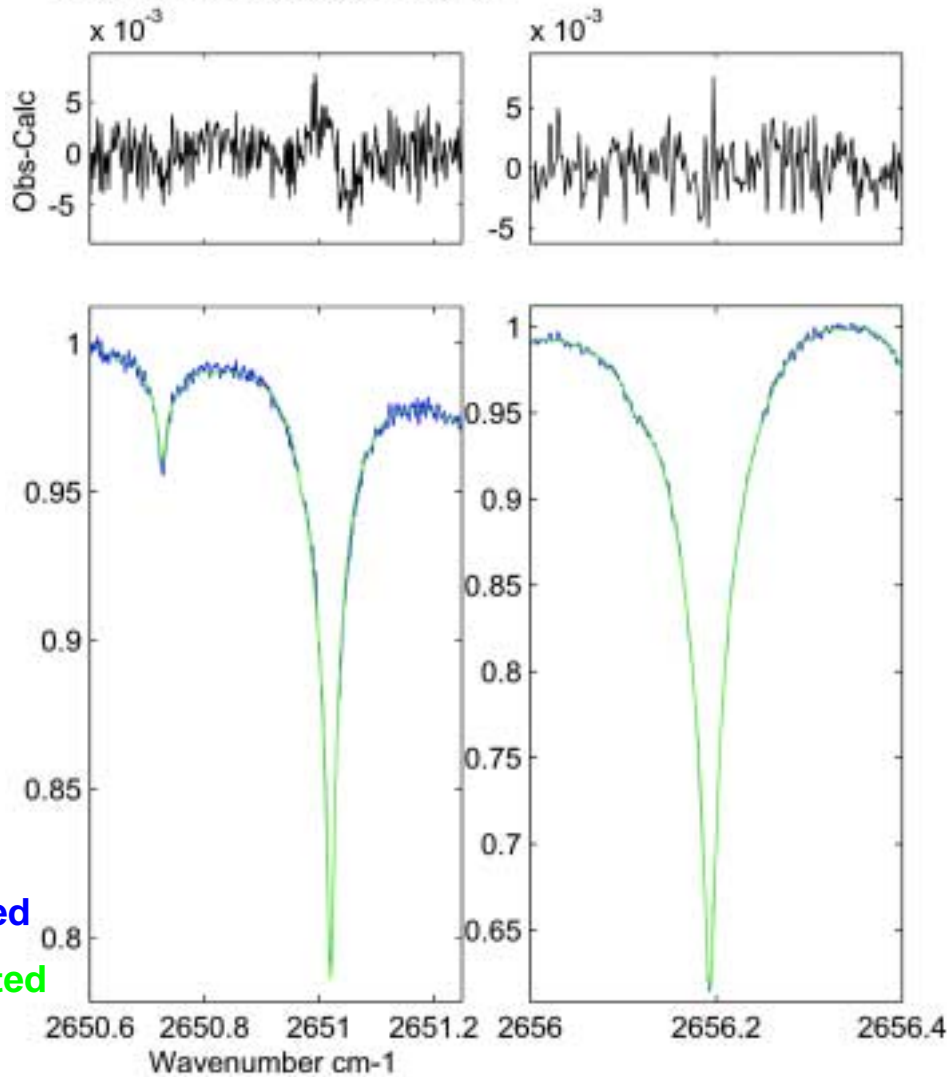
ULB and Hitran databases comparison

Retrievals & soundings comparison

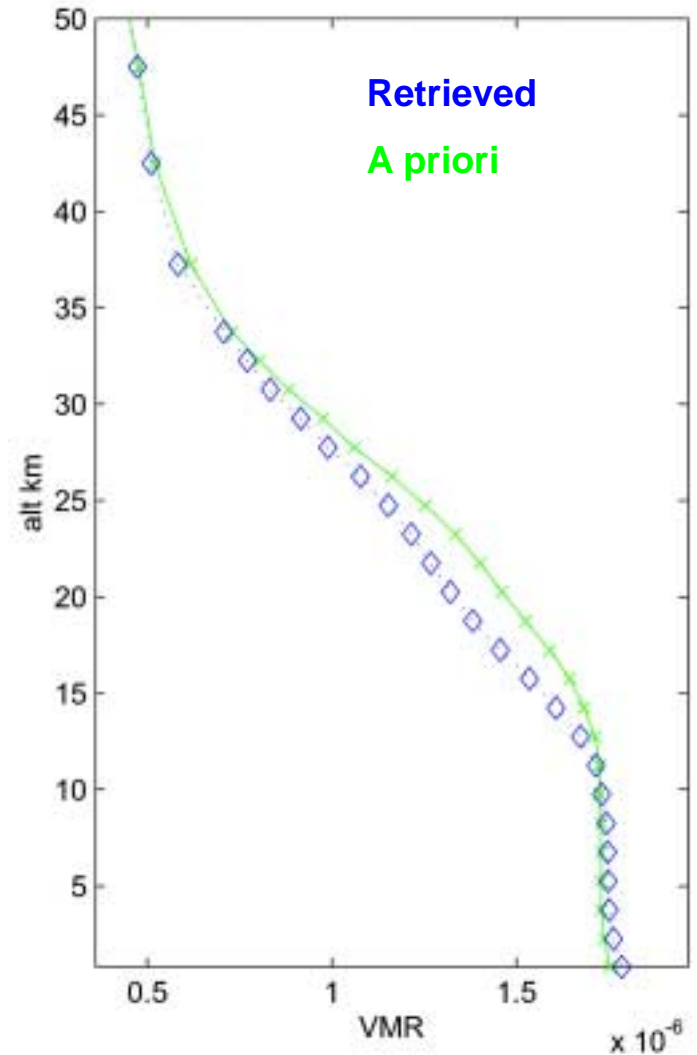
## ✓ Conclusion

# ❖ IR: CH<sub>4</sub> retrieval (SFIT2)

r0160501.dat SZA=6015 res=257.14  
VCA=3.610e+019 RMS=2.22e-001

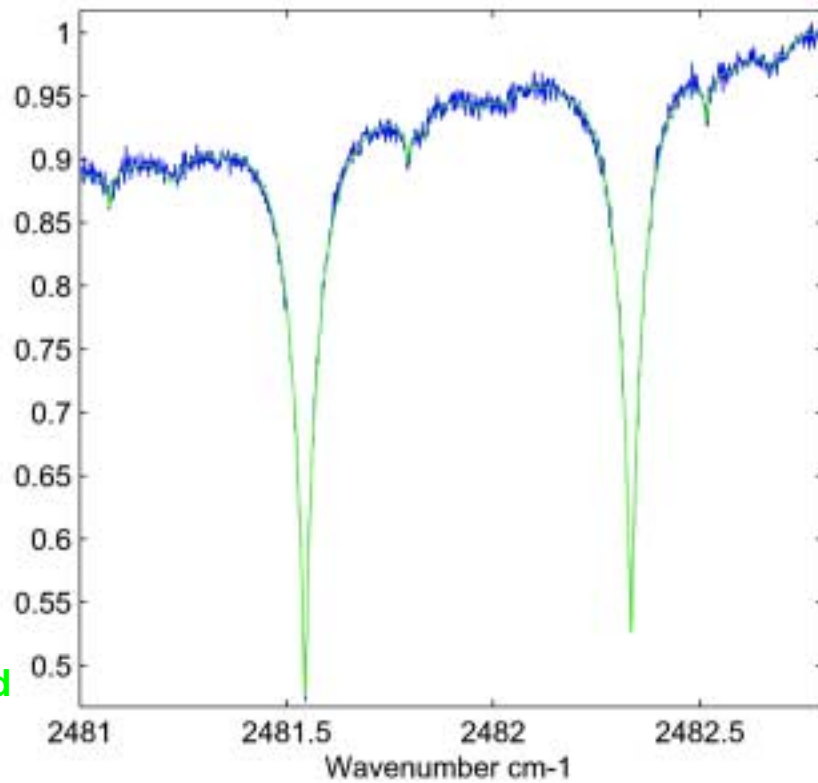
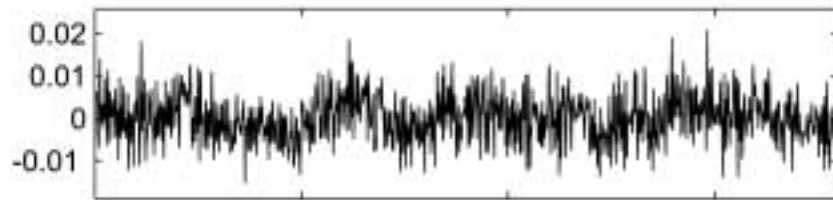


Observed  
Calculated



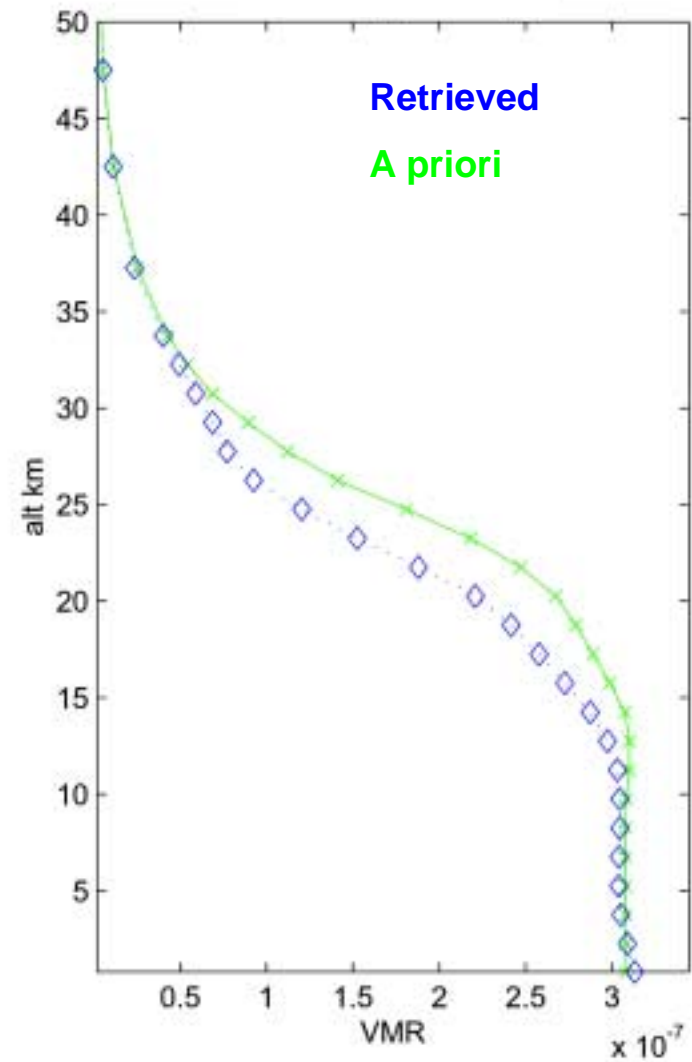
# ❖ IR: N<sub>2</sub>O retrieval (SFIT2)

r0160501.dat SZA=6015 res=257.14  
VCA=6.249e+018 RMS=5.93e-001



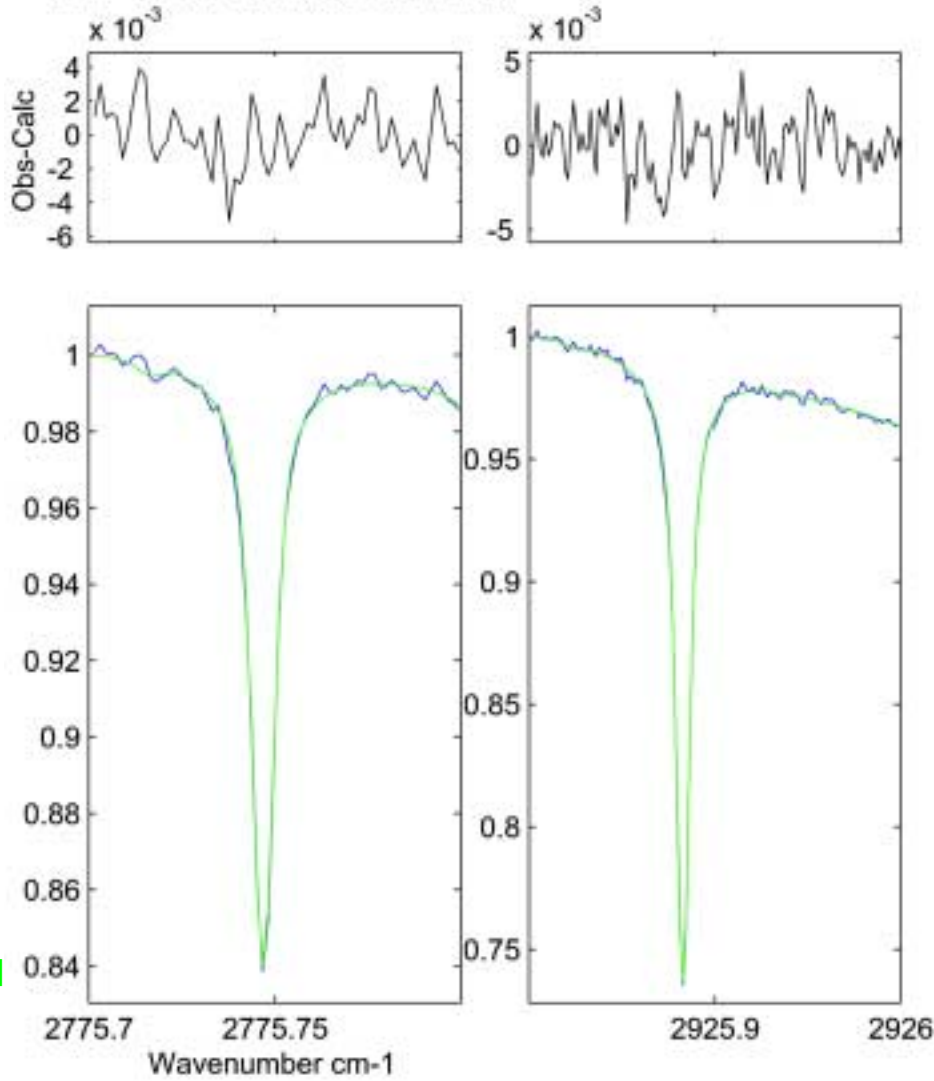
Observed

Calculated

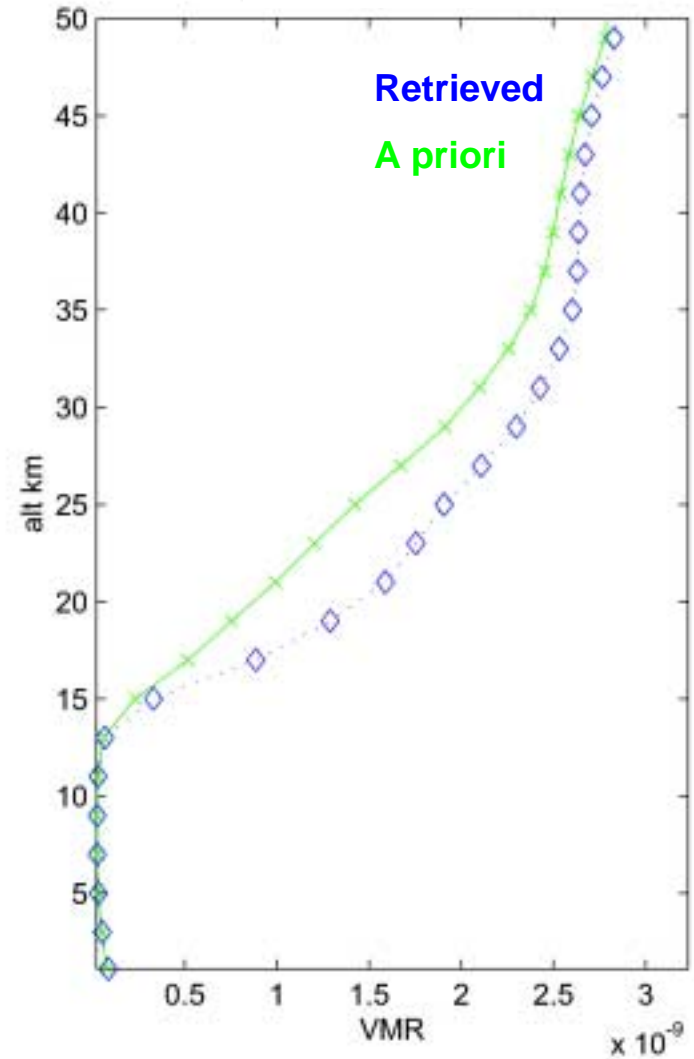


❖ IR: HCl retrieval (SFIT2)

r0160501.dat SZA=6017 res=257.14  
VCA=4.638e+015 RMS=1.75e-001

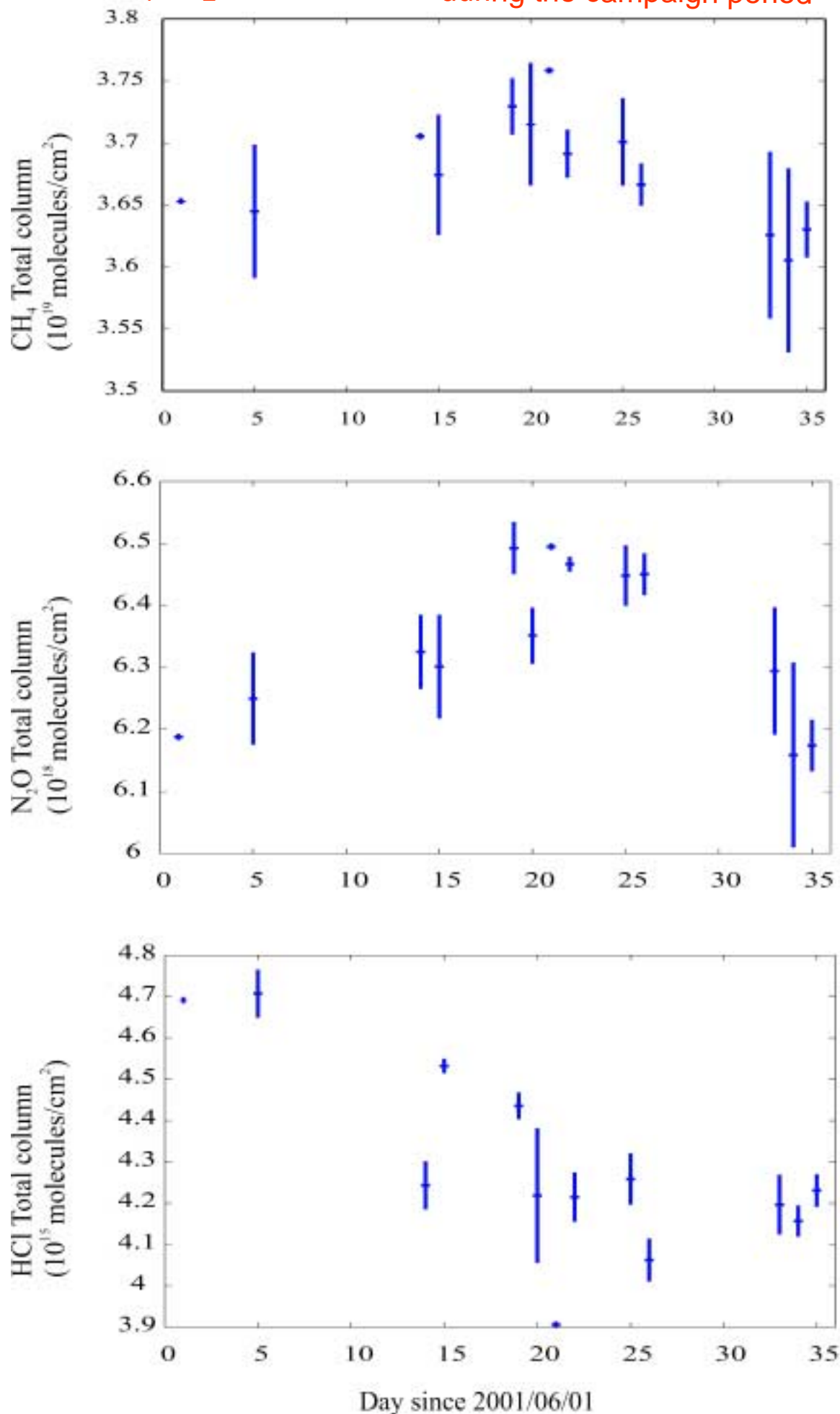


Observed  
Calculated

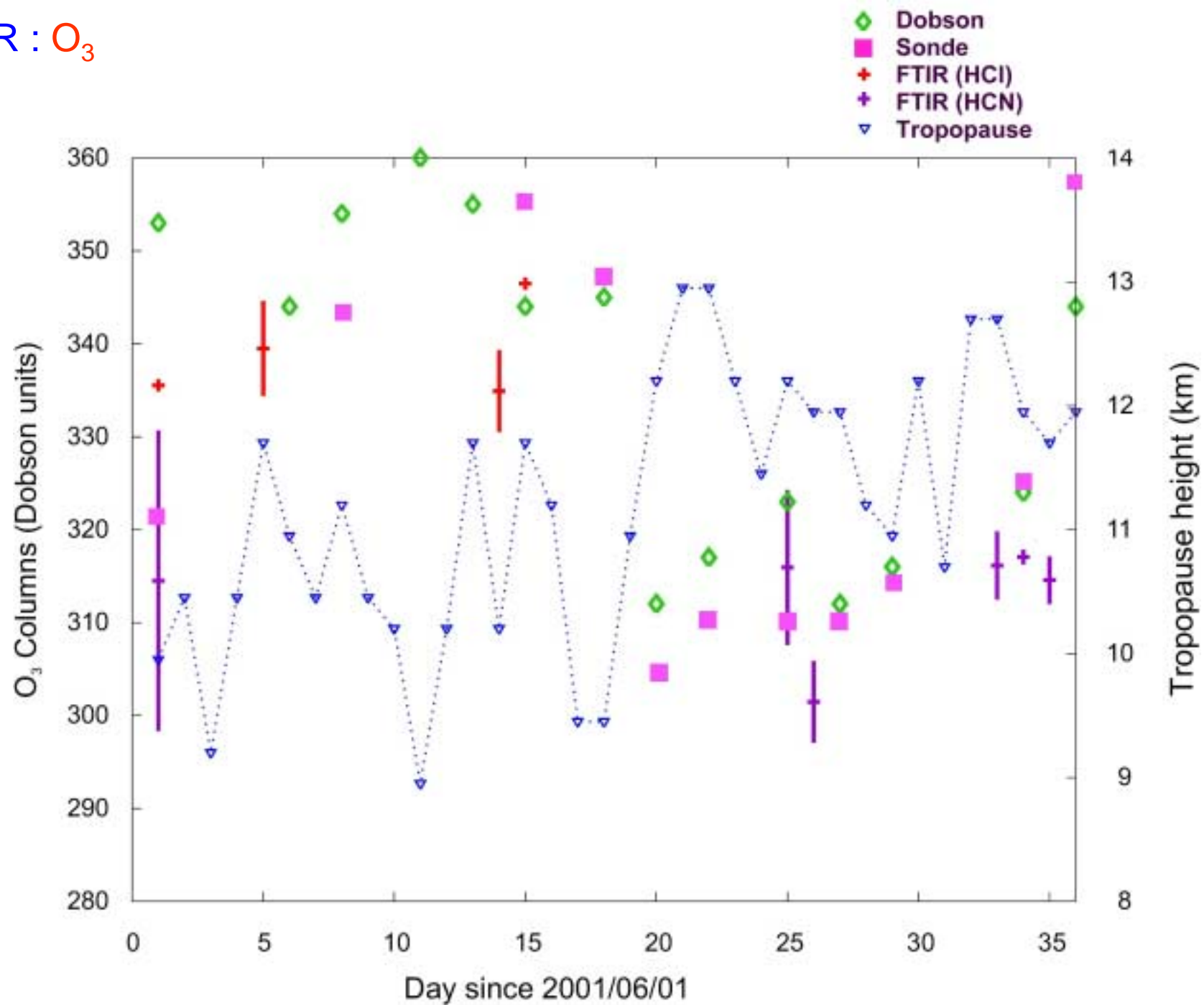


❖ IR: CH<sub>4</sub>, N<sub>2</sub>O, HCl

Concentration data  
during the campaign period

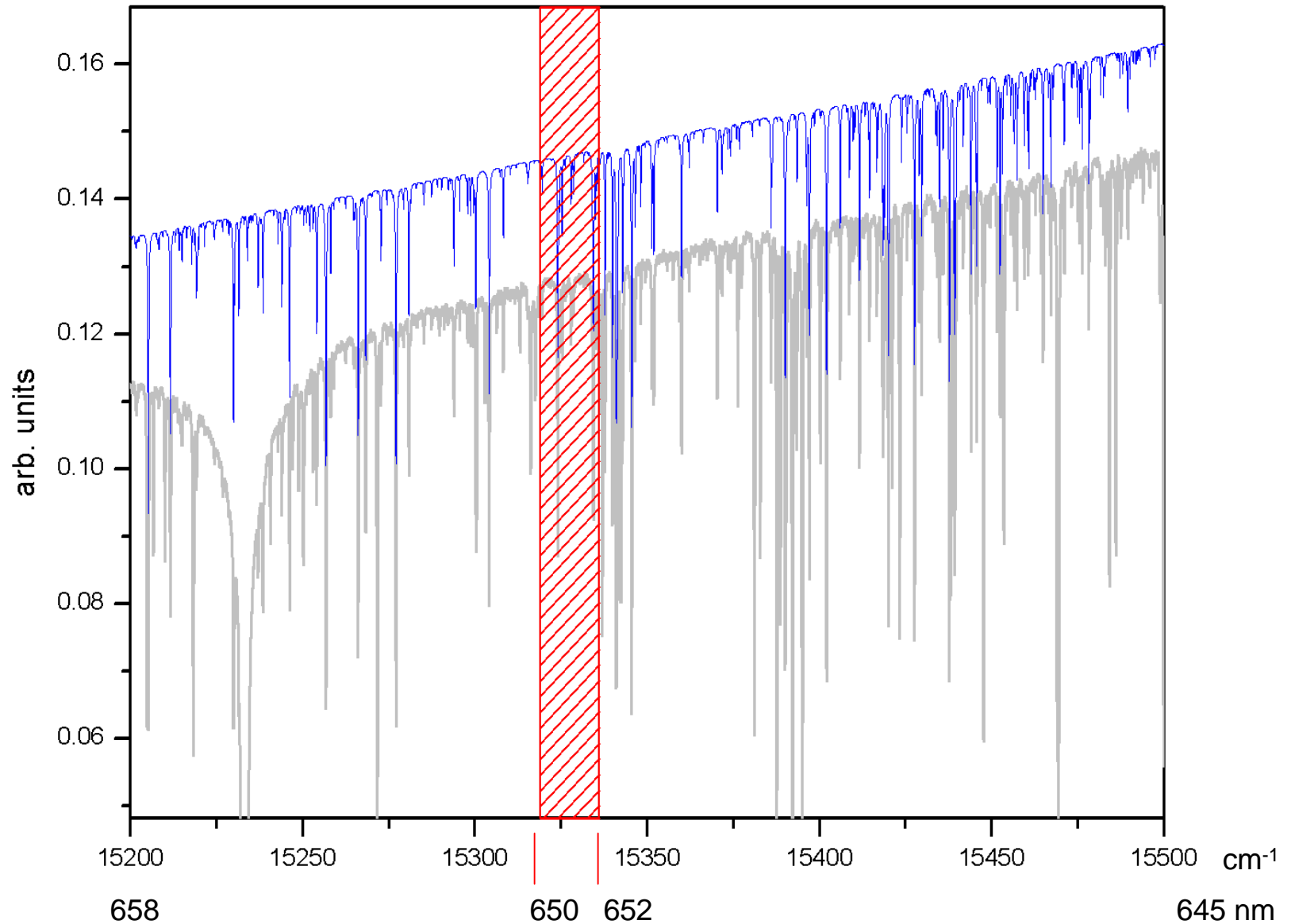


❖ IR: O<sub>3</sub>



❖ VIS: H<sub>2</sub>O

— ground based solar spectrum 25th june, 11h08, SZA = 40.83°, 0.1 cm<sup>-1</sup> resolution  
— synthetic H<sub>2</sub>O absorption spectrum from ULB 2002 linelist





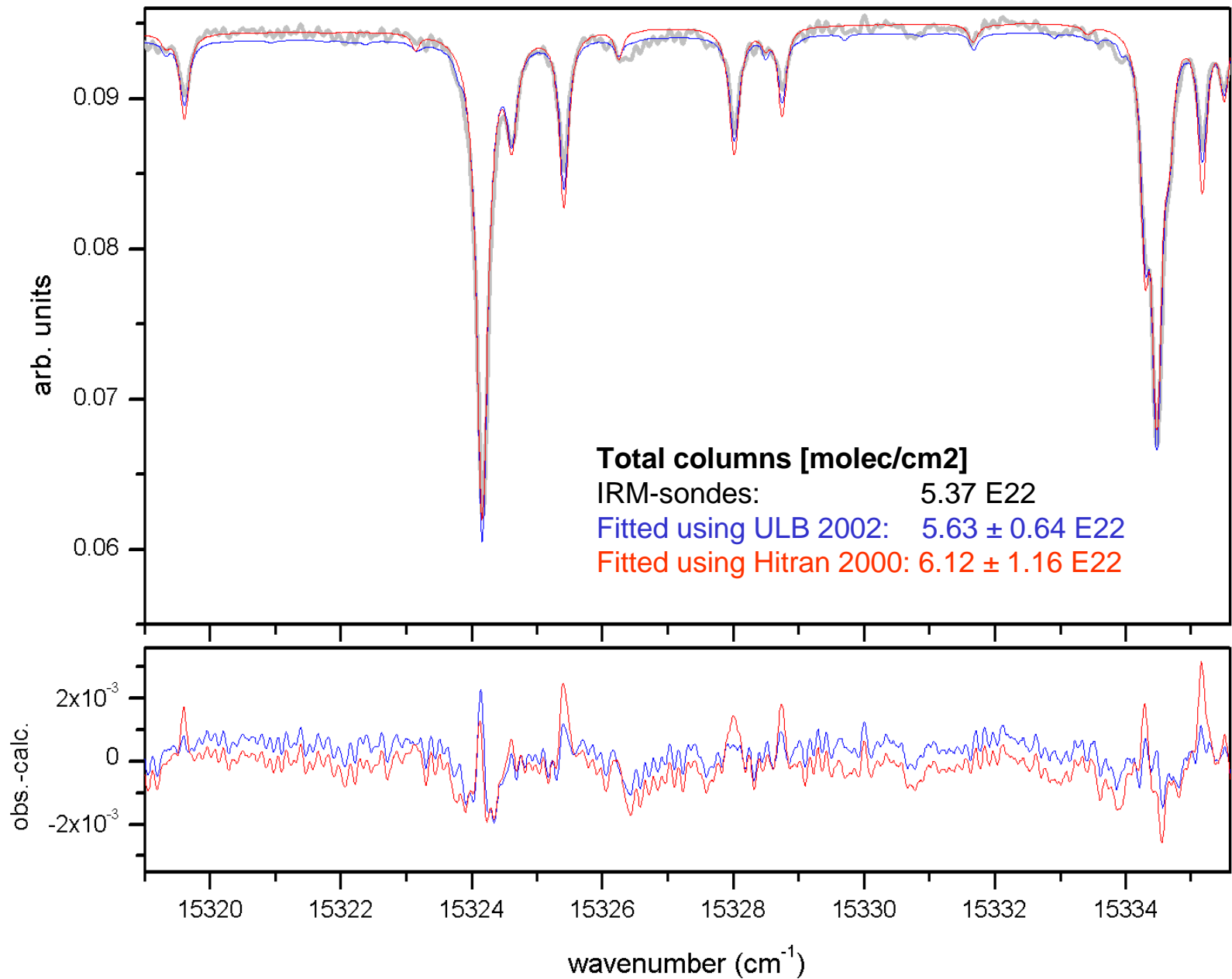
VIS: H<sub>2</sub>O

— ground based solar spectrum 25th june,11h08, SZA = 40.83°, 0.1 cm<sup>-1</sup> resolution

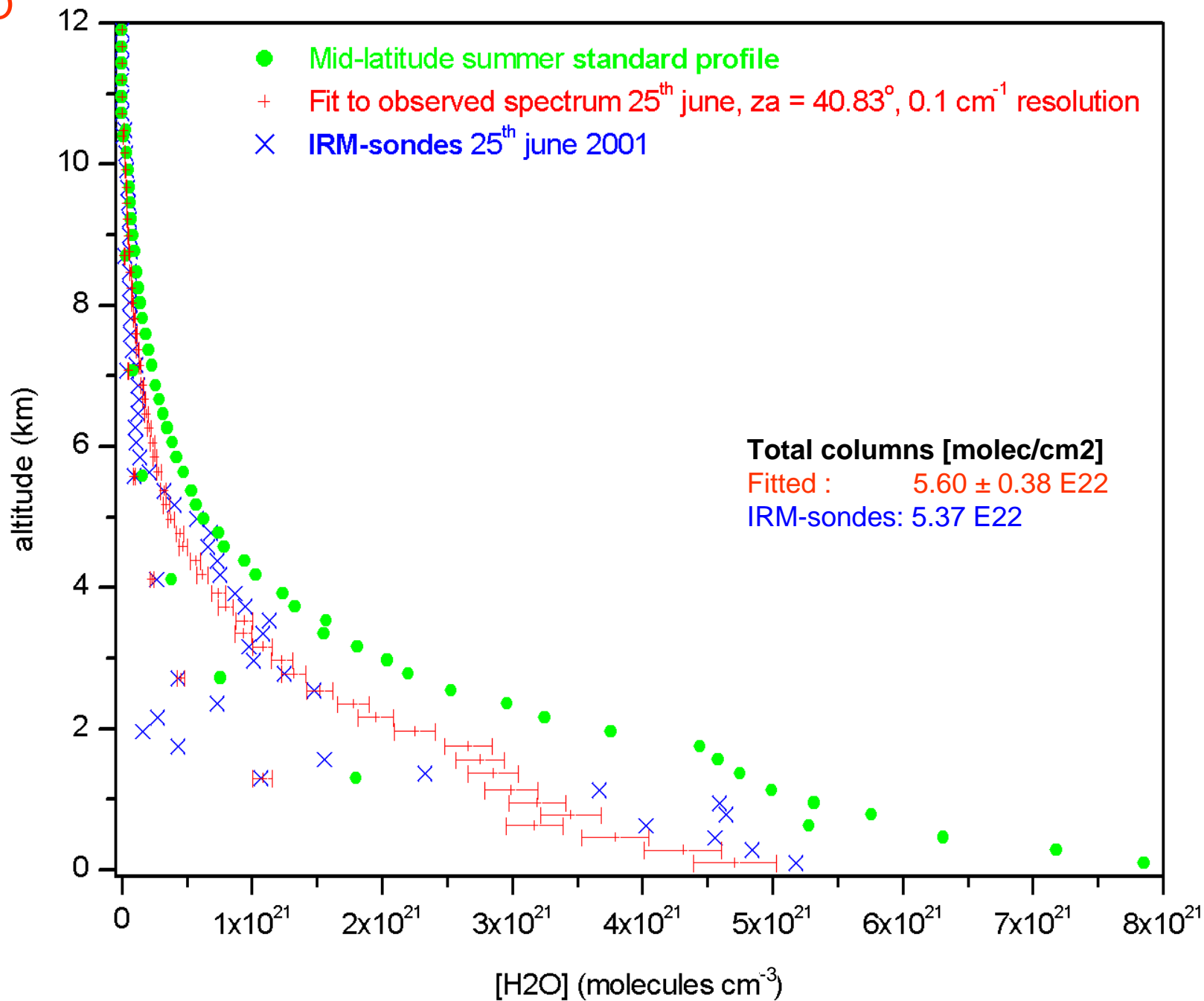
— fitted using ULB 2002 H<sub>2</sub>O linelist (32 lines)

— fitted using HITRAN 2000 H<sub>2</sub>O linelist (17 lines)

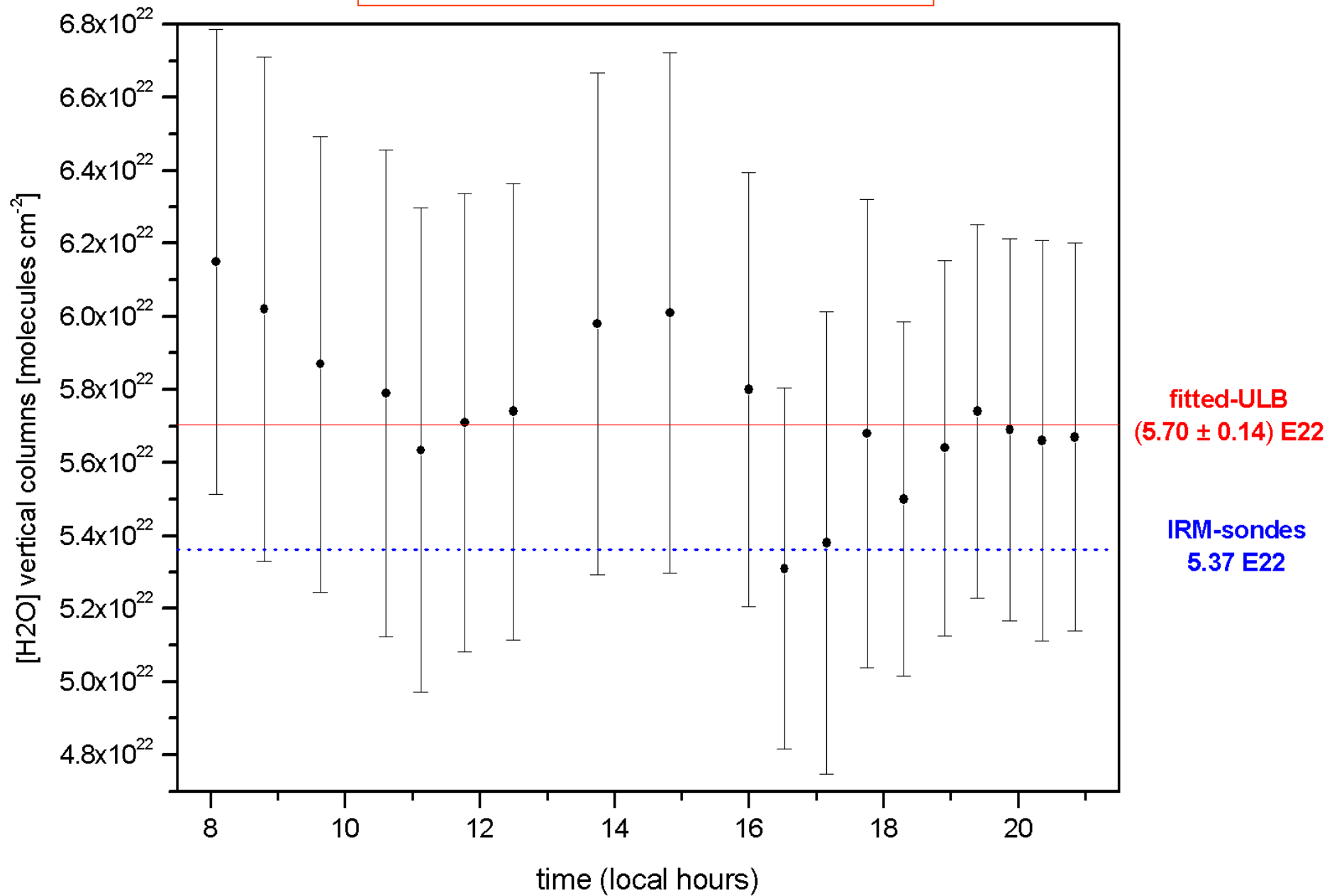
→→ Coheur *et al.*, JQSRT, 2002



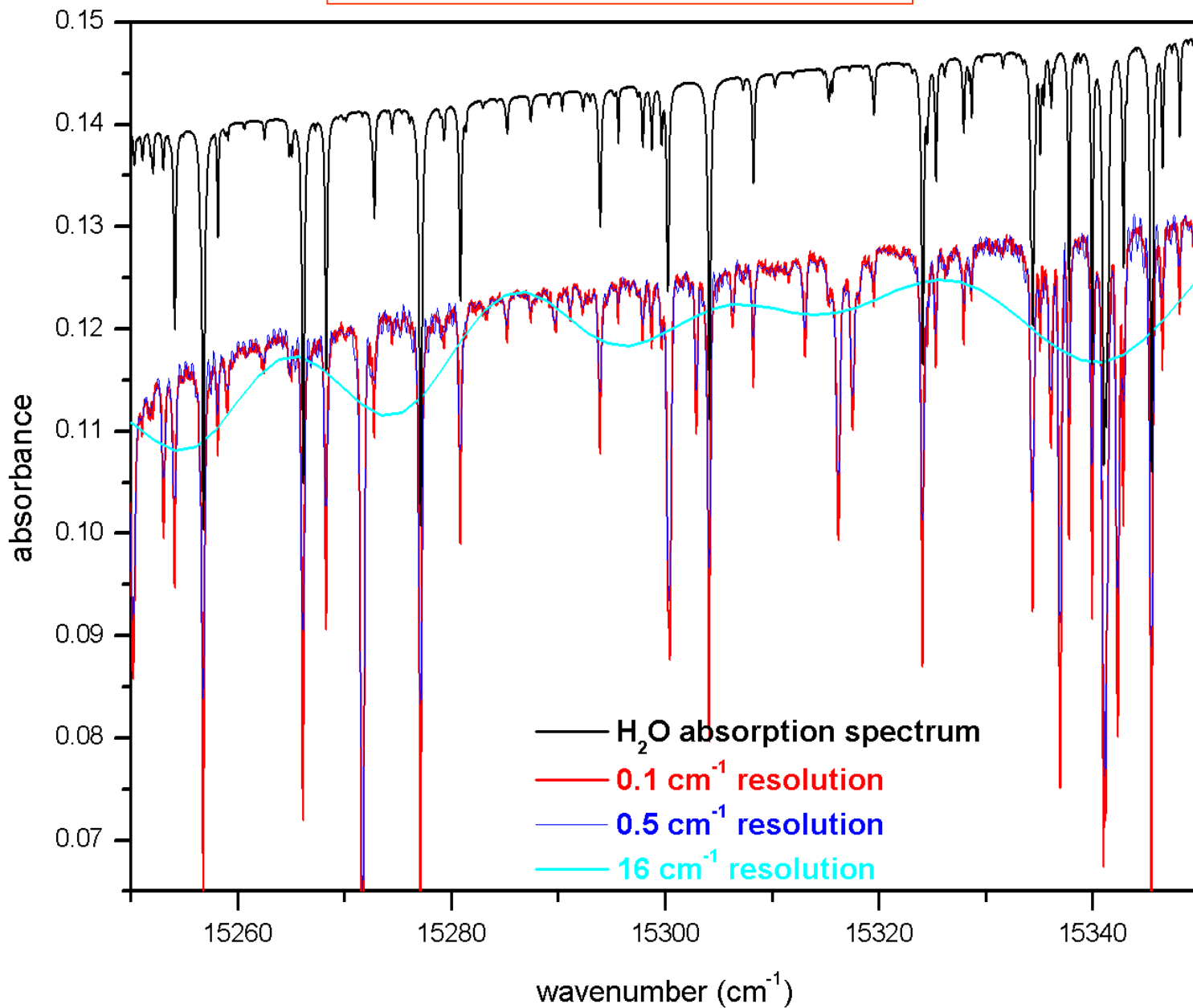
❖ VIS: H<sub>2</sub>O



Daily variations of concentrations

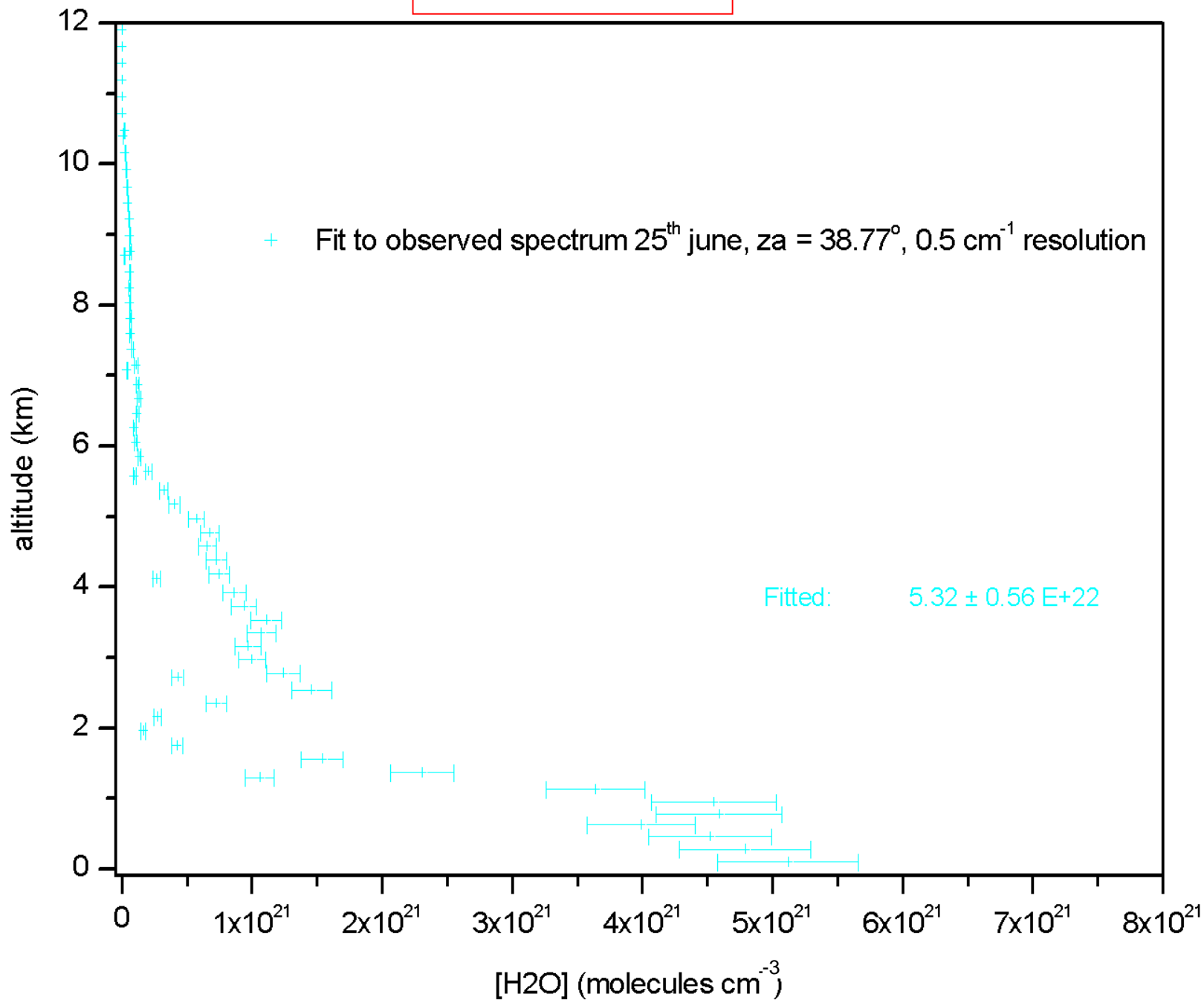


Resolution effect & solar lines



❖ VIS: H<sub>2</sub>O

Resolution effect



## ✓ Concluding remarks

- ❖ Important stratospheric and tropospheric species have been observed during the campaign on clear sky days.
- ❖ Comparison with correlative data at the same site from PTU Sondes for H<sub>2</sub>O observations and independent data (Dobson & sondes) for O<sub>3</sub> measurements shows good agreements.
- ❖ Work is in progress on the comparison between FTS UV/VIS and FTIR results.