Evaluation of O_2 linelists in the 1460 to 1660 cm^{-1} region

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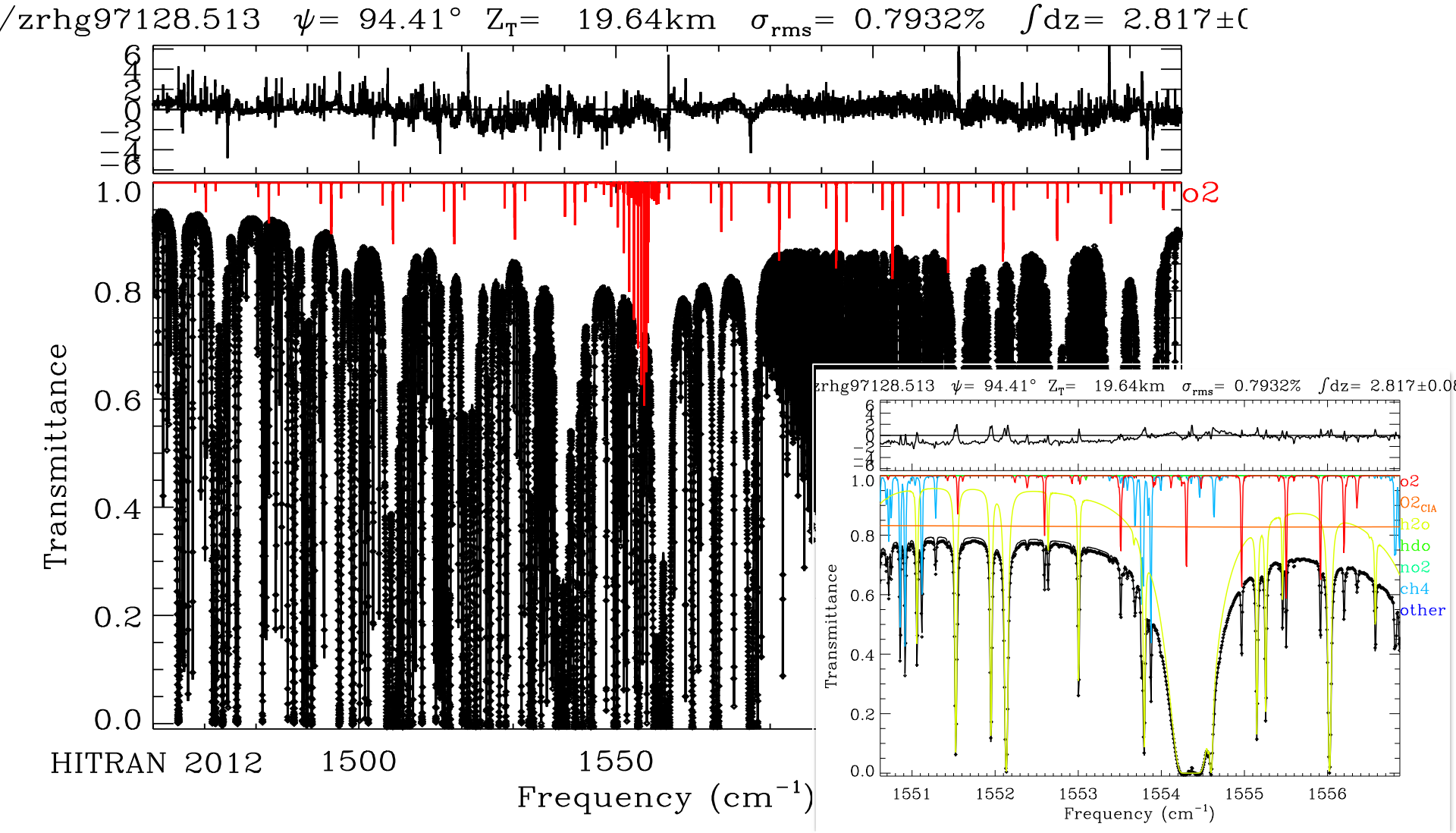
Fitted an occultation of MkIV balloon spectra in the 1460 to 1660 cm-1 region using 3 different linelists:
HITRAN 2012
HITRAN 2012 with the O_2 replaced by 07_hit14.par
HITRAN 2012 with the O_2 replaced by 07_hit14_no_md_vib.par

At low altitudes this spectral region is blacked out by O_2 CIA and H_2O absorption. At high altitudes the O_2 lines become very weak.

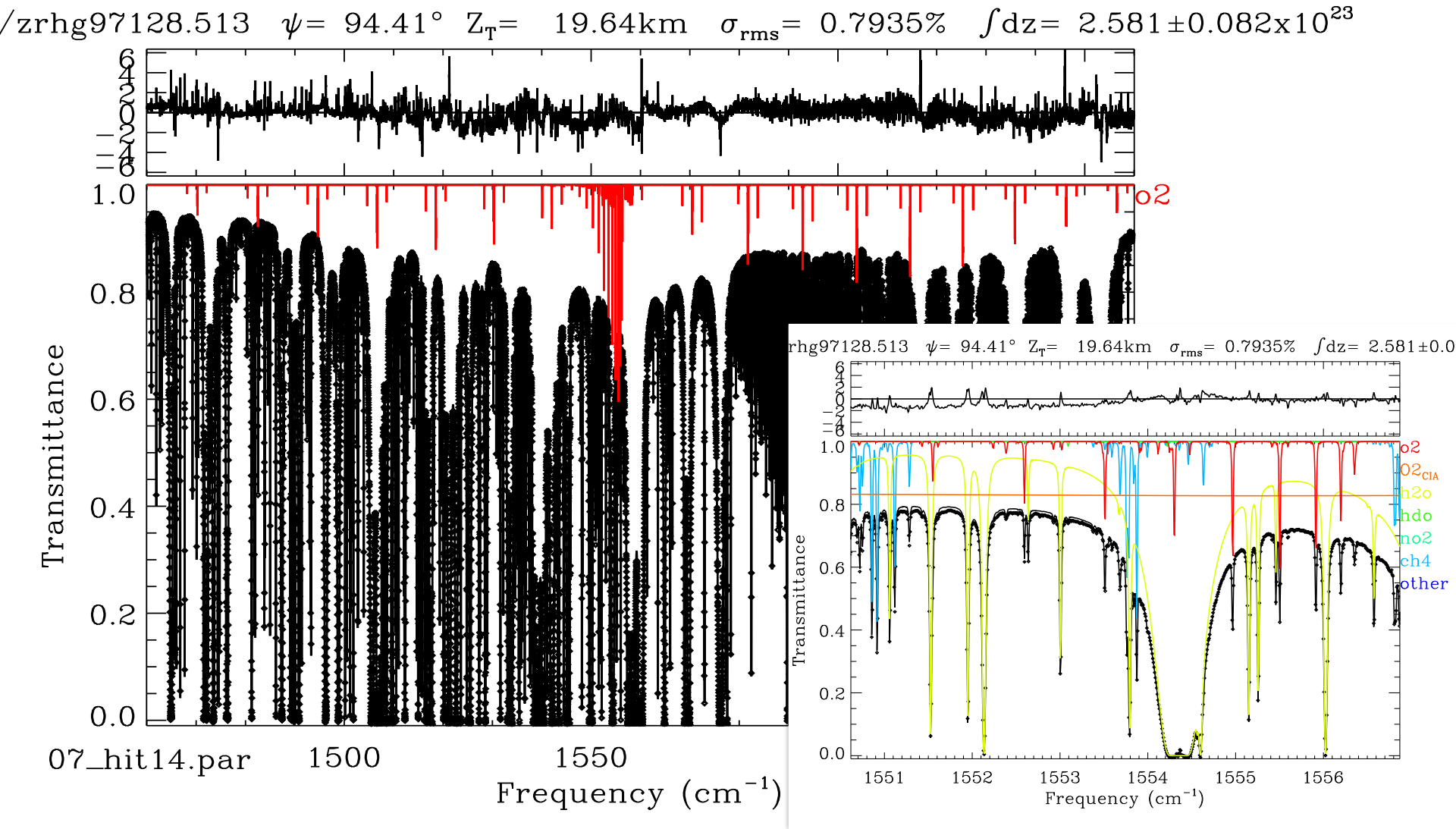
Subsequent plots show spectral fits to a 19 km tangent altitude limb occultation spectrum. In addition to O_2, H_2O, O_2_CIA, CH_4, and NO_2 also absorb strongly.

On each slide, the inset plots shows a zoom of the Q-branch region.

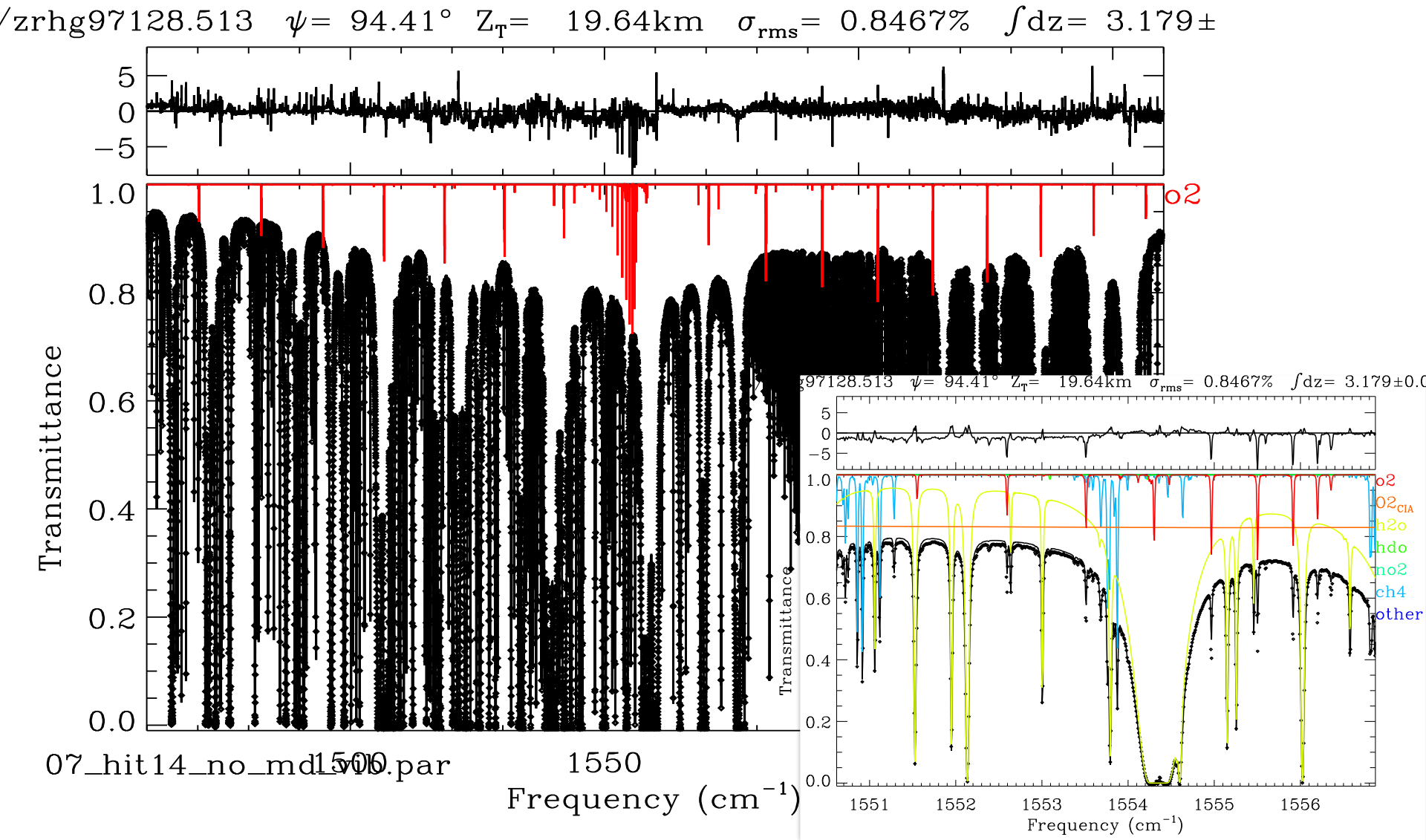
HITRAN 2012 linelist



07_hit14.par linelist



07_hit14_no_md_vib linelist



Summary

07_hit14.par linelist gives similar-looking spectral fits as HITRAN 2012, but with the retrieved O_2 amount increased by ~10%.

07_hit14_no_md_vib.par give much poorer fits because it is missing many important O_2 lines.