RESULTS

Set-up of Measurements

Fig. 1: Overview of the oxygen A band absorption (arb. units) at the highest and the lowest pressure of pure oxygen (see table for experimental details).

Voigt versus Galaxy line profile

Fig. 2: Comparison of line fitting obtained with Voigt (blue) and Galaxy (green) line profiles. The observed pressure @ 80 hPa (divided by blank) is in black. The Observed - Fitted residual is shown below (amplitude +/- 5%). This line corresponds to 88% of absorption.

P-induced effects

Fig. 3: Pure O₂ spectra at different pressures (0.02, 0.04, 0.08, 0.2, 0.4 hPa) clearly showing self-broadening and shifting. Also shown is a blank spectrum containing the external atmospheric O₂ contribution.

Fig. 4: N₂-broadening and shifting. Note the line shape 'degradation' at the highest O₂+N₂ pressure, explaining the difficulty of obtaining high precision parameters.

Fig. 5: Examples of good (RR(1), RR(3)) and less good (RR(17)) results for the pressure dependence of the Lorentzian linewidth.

DISCUSSION: Comparison with literature data

Fig. 6 & table: This work shows a slight negative but systematic difference with HITRAN, inferred to the multi-step calibration procedure.

Intensities

Fig. 7: Average ratios are written in ( )

Self broadenings

Fig. 8: Still large errors for some lines.

N₂-shifts

Fig. 9: Few literature data

This work gives new data at high J

Good agreement between Brown, Hill and this work, and similar trend