

Supplementary materials

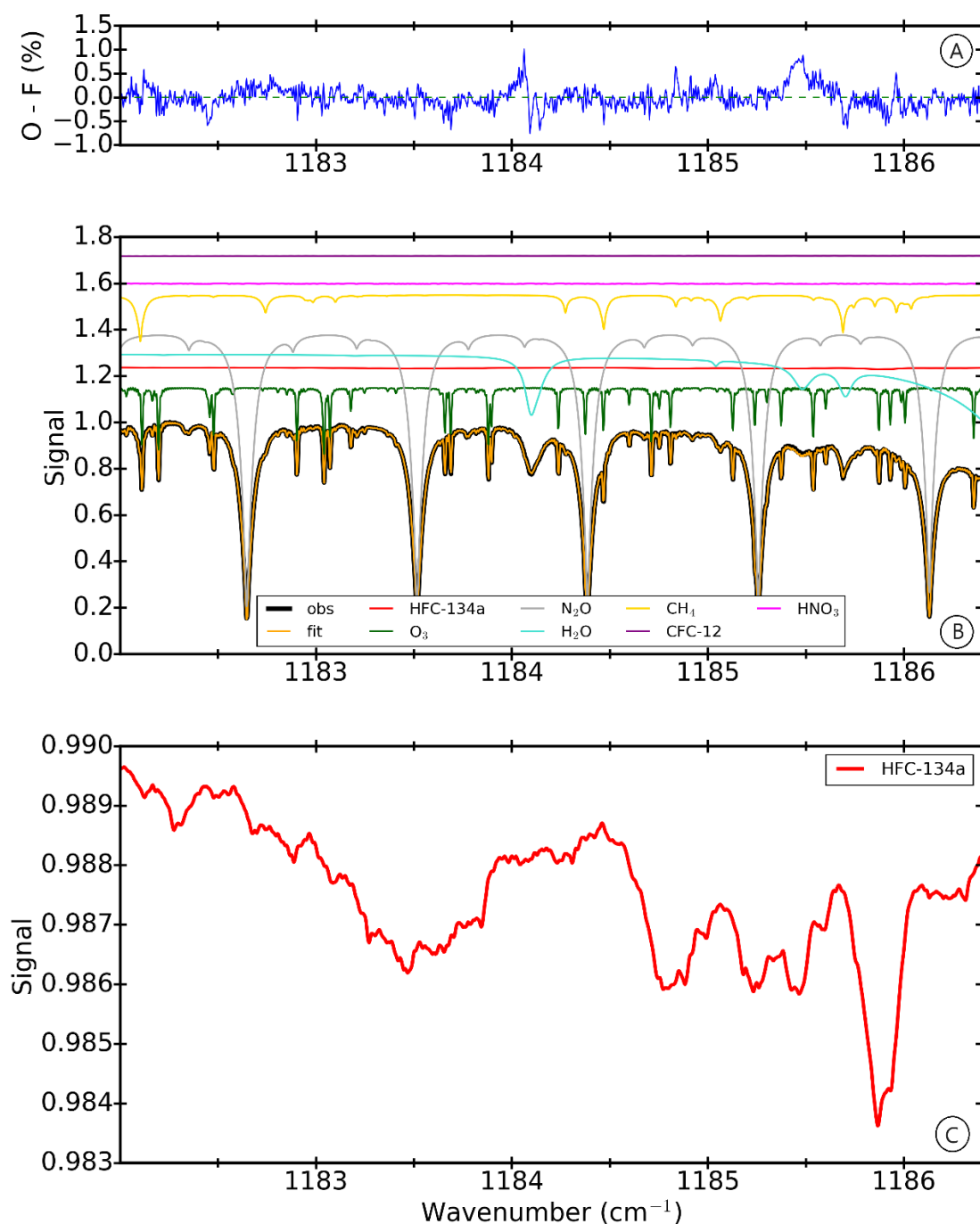


Figure 1. Second spectral window test for HFC-134a. Panel A displays the observed – calculated residuals, in %, from the simulation to the same spectrum as the one shown in Figure 1 in the main text (recorded on May 25, 2016). The root-mean-square of the fitting residuals is 0.23 %. Panel B shows the simulation of the 1182.0 – 1186.4 cm⁻¹ spectral window from spectra recorded by the Bruker IFS-120HR FTIR instrument at the Jungfraujoch station at an apparent solar zenith angle of 77.2°, and a maximum optical path difference of 82 cm. The signal-to-noise ratio for this spectrum is 952. The main interfering species (O₃, N₂O, H₂O, CH₄, CFC-12, and HNO₃) are shifted vertically for clarity. Be aware of the scale of the vertical axis in Panel C, where the HFC-134a absorption is magnified. Attention, the water vapor absorption present between about 1185.0 cm⁻¹ and 1186.4 cm⁻¹ becomes stronger for more humid days, masking the main absorption of HFC-134a in this spectral window.

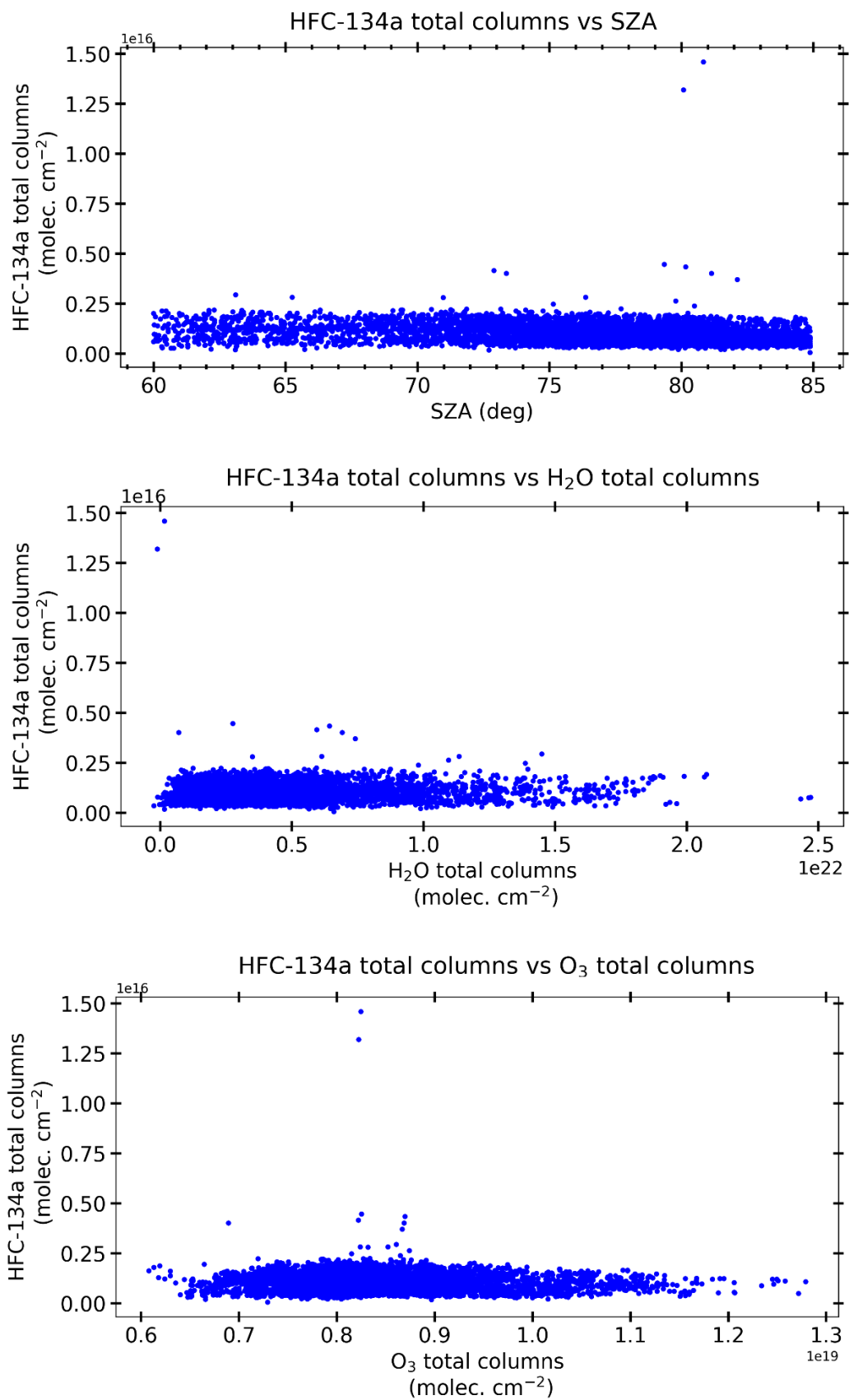


Figure 2. HFC-134a total columns retrieved from the ground-based FTIR solar spectra at the Jungfraujoch station versus the solar zenith angles (SZA) on the top, versus the H_2O total columns on the middle, and versus the ozone total columns on the bottom figures.