

Dear Anonymous Referee #2,

Many thanks for your helpful comments and corrections.

In the following we list our changes in the manuscript.

- Page 3554, equations 3 and 4: epsilon zero is not defined.

Page 3554, line 8 has been changed to:

“Following Guelachvili (1981), the spectrum of a monochromatic light derived from an interferogram with periodic sampling error ε of frequency β and amplitude ε_0, \dots ”

- Page 3555, lines 11-14: These sentences belong also to the abstract.

Agreed. The abstract has been modified to give a more complete overview of the method:

“... To ensure network wide consistency, biases between Fourier Transform spectrometers at different sites have to be well controlled. Messerschmidt et al (2010) have shown errors in interferogram sampling can introduce significant biases in retrievals. In this study we investigate a two-step scheme to correct these errors. In the first step the laser sampling error (LSE) is estimated by determining the sampling shift which minimises the magnitude of the signal intensity in selected, fully absorbed regions of the solar spectrum. The LSE is estimated for every day with measurements which meet certain selection criteria to derive the site-specific timeseries of the LSEs. In the second step, this sequence of LSEs is used to resample all the interferograms acquired at the site, and hence correct the sampling errors. ...”

and the line:

“The LSE introduces retrieval biases which are minimised when the interferograms are resampled.”

has been cut.

- Page 3555, line 16: I would mention here also the HFL= 15798 cm⁻¹.

The sentence has been changed to:

”It is essentially opaque for slant H₂O column abundance of $>5 \times 10^{22}$ molecules cm⁻² (generally satisfied at large solar zenith angles) and the associated aliased ghost interval at 8440–8510 cm⁻¹ (HFL=15798 cm⁻¹) has appreciable signal levels.”

- Page 3577: Figure 8 should be described in more detail

The figure has been updated to use the standard representation of outliers, and additional text describing and interpreting the figure has been added in the caption. This now reads:

“The upper panel shows Lauder 125HR X_{air} retrievals from original 10 and 20 kHz data (red and black points respectively), acquired between 18 January and 18 March 2010 at solar zenith angles of 40-60 degrees. The corresponding resampled 10 kHz retrievals are shown in yellow and resampled 20 kHz retrievals are shown in purple. To aid comparison, the lower panel shows box-whisker summaries of the distribution of X_{air} retrieved at 10 and 20 kHz before and after resampling (these summaries are for the measurement subintervals when both sample rates were used, and are shown with the larger sized symbols in the upper panel). There is clear evidence of a low bias of 0.2% in the original 10 kHz X_{air} retrievals, relative to

the 20 kHz retrievals. After resampling, the distribution of X_{air} retrieved at 10 kHz lies entirely within the range of the 20 kHz X_{air} distribution, and central 50% of two distributions (the boxes) are essentially co-incident (the medians differ by 0.01% and the lower fourths differ by 0.03%).