First of all, we would like to thank the anonymous referees for their corrections and useful comments. Specifically, we would like to thank referee #2 for the very patient correction of wording. Our responses to individual questions raised by referee #2 are inserted below.

Specific Comments

Page 7187, Abstract – The abstract is rather brief. I suggest adding a few sentences that address the implications of the work and how the findings will be used. Define what is being calibrated.

We have added the following statements:" The new calibration procedure introduced here assigns effective pressure values to each individual cell to account for additional broadening of the HCl lines. This approach will improve the consistency of the network by significantly reducing possible station-to-station biases due to inconsistent ILS results from different HCl cells. We demonstrate that the proposed method is accurate enough to turn the ILS uncertainty into an error source of secondary importance from the viewpoint of network consistency."

Page 7192, last para – Briefly comment on the normalization that results in a modulation efficiency greater than 1.

We added the following explanation: "Note that the rise of ME amplitude beyond 1.0 does not indicate that the interferometer is more efficient than the ideal interferometer, rather this behaviour results from the fact that the ME amplitude is always normalized to 1.0 at zero path difference to ensure that the ILS is area-normalized in the spectral domain. In fact, when the ME amplitude rises above 1.0, the modulation is less than ideal at small OPD due to the assumed shear misalignment."

Page 7195, lines 18-22 – Comment further on the behavior of the ME beyond 45 cm, and why the HCl and C2H2 results differ.

We extended our explanation, which now reads: “This indicates that the effect is most likely an artefact from the HCl cell itself (actual HCl line shape differs from assumed Voigt line shape), as probably is the ME bump at 45 cm observed in the ME amplitude derived from C_2H_2. A very minor collisional narrowing effect acting on the spectral lines which is not included in the Voigt model will trigger an artificial increase in the reconstructed ME amplitude.”

Page 7196 – A simple flowchart would be useful to illustrate the steps and inputs in the calibration procedure.

We added a new paragraph at the end of section 4 which summarizes the procedure: “Collecting all the procedural steps described in this section, the calibration can be summarized in the following step-by-step workflow: (1) A spectrum is recorded with both the reference cell and the HCl cell in the beam path. The 40 cm long and pressure-monitored reference cell is filled with 3 mbar of C_2H_2. (2) A joint fit of ME and gas temperature is retrieved from the C_2H_2 lines, using the spectral window 6560.5 to 6609.5 cm^{-1}. (3) The resulting ME is adopted for the following analysis of the HCl spectrum. (4) The HCl pressure and gas temperature is retrieved using the spectral window 5712.0 to 5782.0 cm^{-1}. While the column amounts and pressure values are fitted individually for $H^{35}Cl$ and $H^{37}Cl$, a common value for the gas temperature is required. The resulting gas temperature is expected to agree with the temperature retrieved from C_2H_2 within a few 0.1 K. (5) The final product of the calibration process are the effective pressure values at a reference temperature of 296 K and the column amounts for $H^{35}Cl$ and $H^{37}Cl$. (6) These effective pressure values replace the physical pressure values calculated from gas temperature, column amounts, and cell length in subsequent retrievals of ME of other spectrometers. If the gas temperature deviates from 296 K, the effective pressure values are converted to the actual temperature by assuming that the effective pressure is proportional to the absolute temperature.”

Page 7198, lines 21-28 – Clarify the discussion here regarding why “the observed bias reveals half of the actual bias”.

We have reworded our statement concerning the propagation of the calibration bias: “For estimating the full systematic bias, one possible assumption would be that a linear extrapolation of the observed ME amplitude change towards zero C_2H_2 pressure would provide the real ME. This assumption is motivated by the fact that in the zero pressure limit, the line shape converges to a pure Gaussian, and by the expectation that the spectral signal due to an incorrect line shape model is proportional to pressure in the low-pressure region. Under this assumption the observed amplitude change of the ME amplitude bump at 45 cm reveals half of the total effect (as we have made two measurements: the one using 3 mbar C_2H_2 pressure, which is the standard value we apply in the calibration procedure, and the other measurement performed for this sensitivity analysis, using 1.5 mbar pressure). As a consequence, the empirical numbers given above should be multiplied by a factor of 2 (and the ME amplitude bump as retrieved from C_2H_2 would be overestimated, but is not a spurious feature altogether). Following this line of argument, we can conclude that the systematic bias of the calibration method is 0.03 mbar ($H^{35}Cl$) and 0.054 mbar ($H^{37}Cl$), respectively.”

Page 7207, Figure 2 – I suggest overlaying a line indicating the path of the beam, and add numbers to items that can be referenced in the caption, rather than repeatedly using “on the left” and “on the right”, which is hard to match to the various components.

We revised the figure accordingly.

Technical Corrections

We applied all technical corrections suggested by referee #2, except one: we retain the syntax “wave number” instead of adopting “wavenumber”. Most online references, e.g. wikipedia, accept either notation. Both notations can be found in relevant journals as Applied Optics or JQSRT.