

Figure S1: The optical filter transmission spectrum is shown for detection axis 1 (450 nm band pass filter). The HCHO fluorescence and the N<sub>2</sub> and O<sub>2</sub> Raman spectra are included for reference, all with arbitrary units.

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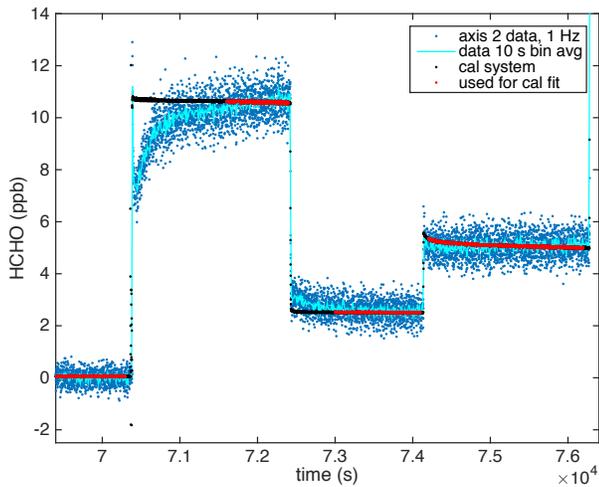
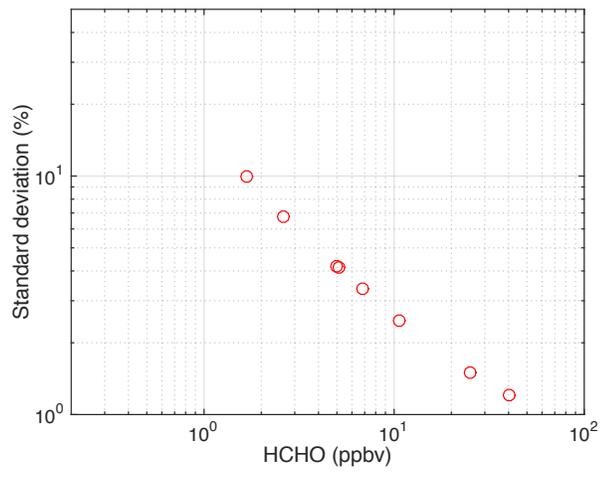


Figure S2: Calibration data from the multi-band pass filter detection axis (axis 2), using the exemplar fitting technique to process the data. Note that the slow time response is due to the calibration system and not the instrument—instrument time response is addressed in Sect. 4.4.

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**Figure S3: The standard deviation for 1 s data normalized by the mean HCHO is shown as a function of HCHO to demonstrate the precision of the HCHO measurement.**