Supplement of

The airborne mass spectrometer AIMS – Part 2: Measurements of trace
gases with stratospheric or tropospheric origin in the UTLS

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Figure S1 The ratio of product to reagent ions [P−]/[E−] (here HFCl/SF₅−) during background measurements is shown for different ion source voltages. The inset shows the timeline of the signal, while the larger plot shows the direct correlation of the average values of [P−]/[E−] and the standard deviation of the background signal for different ion source voltages. With increasing voltage both background level and standard deviation of the background increase. Generally voltages between 400 and 1400V are used for the AIMS ion source.
Figure S2 Ion ratios during background measurements for HNO$_3$, HCl and SO$_2$ during the flight on 11 September 2012. Grey shaded are time sequences where synthetic air was introduced and a stable ion ratio was observed. The red curves represent the fit curves applied to correct for the instrumental background during atmospheric measurements. Generally during the first hour, the background follows an exponential fit. For the rest of the flight, the background can be described by a constant value. For SO$_2$, a constant value of 0.008 was used for the entire flight. For comparison, the ion ratio averages measured during laboratory measurements are given (blue dashed line). Generally, flight and ground based measurements agree well.