Supplementary material
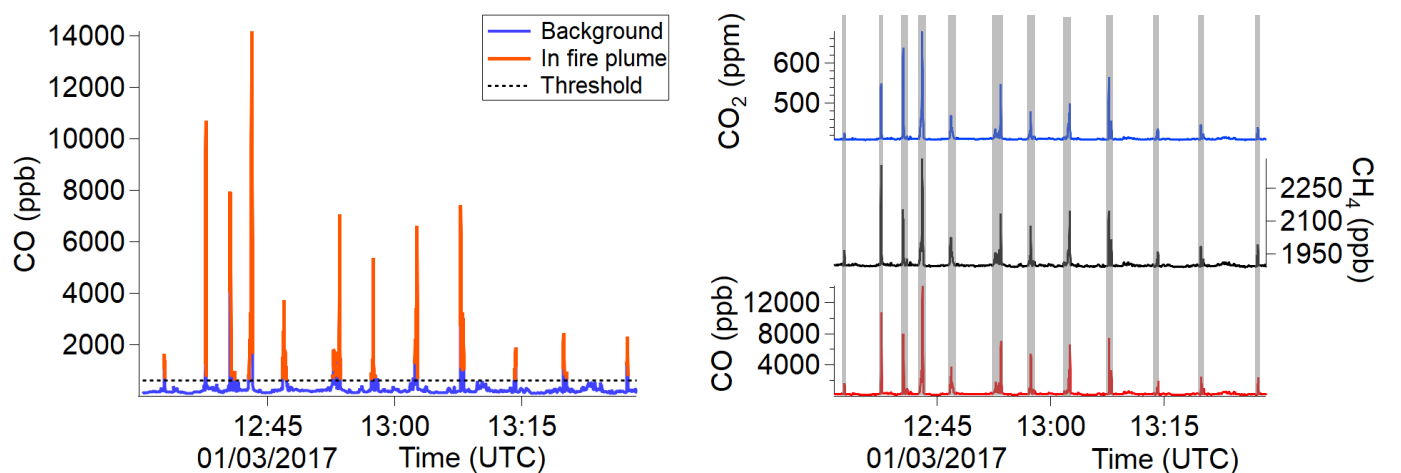
Figure S1: (Left) CO mixing ratio time series over the course of flight C005, with the plumes exceeding the statistical threshold shown in orange and the background shown in purple. The plume selection threshold is also shown as a dashed line. (Right) time series of CO (red), CH4 (black) and CO2 (blue) concentrations over flight C005, the biomass burning plumes chosen for analysis are highlighted in grey.
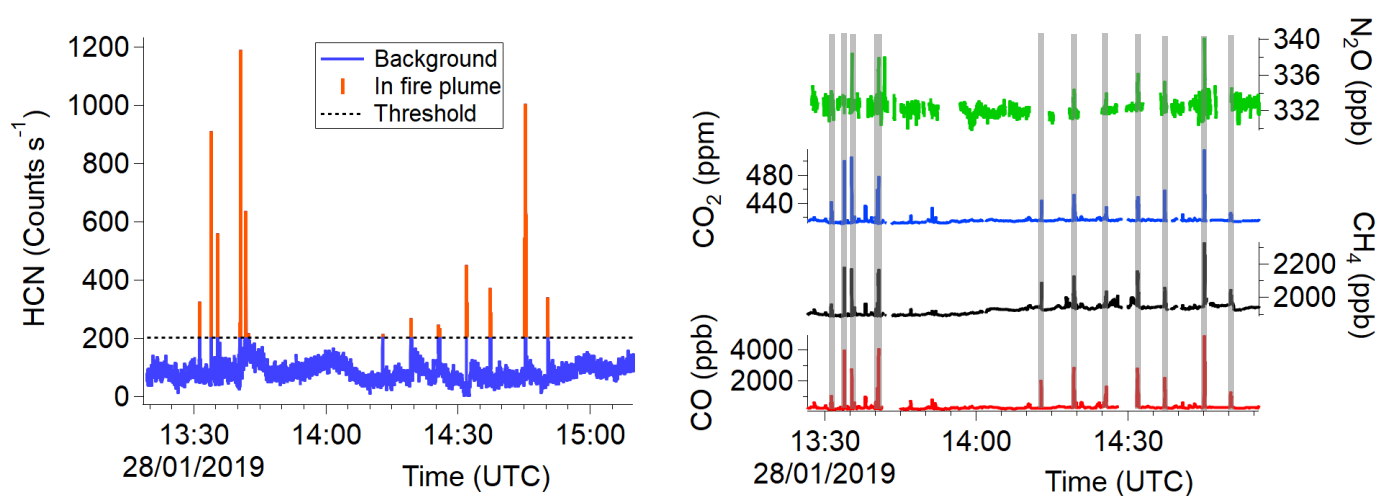
Figure S2: (Left) ToF-CIMS HCN measurement frequency time series over the course of flight C133, with the plumes exceeding the statistical threshold shown in orange and the background shown in purple. The plume selection threshold is also shown as a dashed line. (Right) time series of CO (red), CH4 (black), CO2 (blue) and N2O (green) concentrations over flight C133, the biomass burning plumes chosen for analysis are highlighted in grey.
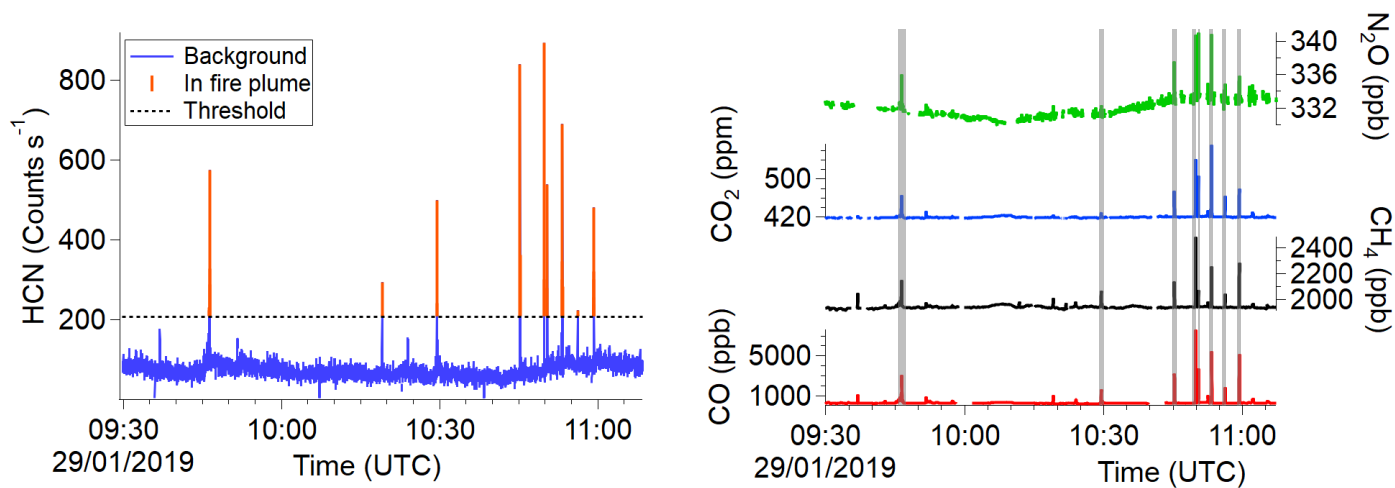
Figure S3: (Left) ToF-CIMS HCN measurement frequency time series over the course of flight C134, with the plumes exceeding the statistical threshold shown in orange and the background shown in purple. The plume selection threshold is also shown as a dashed line. **(Right)** time series of CO (red), CH_4 (black), CO_2 (blue) and N_2O (green) concentrations over flight C134, the biomass burning plumes chosen for analysis are highlighted in grey.