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Characterizing the uncertainty of pyrogenic emissions of trace gases inferred from space-borne data due to injection heights and aerosol optical properties.

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Fires are amongst the most important global contributors of climate-relevant gases and particles, with far-reaching implications for the atmospheric radiation budget, surface air quality, and the water cycle. However, our current understanding of the magnitude and uncertainty of these pyrogenic emissions is far from complete. Formaldehyde (HCHO) is directly emitted by fires and produced chemically by the oxidation of co-emitted volatile organic compounds. We use the GEOS-Chem CTM to relate the observed variability of HCHO columns from the ESA SCIAMACHY satellite instrument to surface emissions of precursor trace gases from tropical and boreal fires. An important focus of the presentation will be quantifying the uncertainty of these inferred emissions due to uncertainties associated with pyroconvection, oxidant chemistry, and assumed aerosol optical properties. We will assess the impact of these uncertainties on calculations of tropospheric ozone.