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In situ ammonia measurements in wildfire and agricultural fire plumes in the US

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Emissions of trace gases and particles from fires have a major impact on climate, visibility, air quality, and public health. Biomass burning emissions include reactive nitrogen gases, in particular, ammonia (NH₃). NH₃ is a short-lived gas that acts as precursor for secondary aerosols formed in the downwind plume. This process is still poorly constrained.

In summer 2019, NASA and NOAA carried out the joint airborne FIREX-AQ (Fire Influence on Regional to global Environments and Air Quality) mission over the continental US to sample plumes from wildfires and agricultural fires. On board the NASA DC-8, we used a modified PTR-ToF-MS instrument for measuring NH₃ in situ and at high time resolution. Over the course of the mission, we collected a large set of NH₃ data in plumes associated with different fire types and burning conditions. Herein, we will present exemplary data and show results of our initial analyses.