

1.194 Measurement and modeling of ground-level and column ammonia for improved health impact assessment in Southern California.

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Abstract:

The emissions, chemistry, and eventual health impacts of tropospheric ammonia (NH_3) are topics of increasing interest, but efforts to quantify and constrain them have been slowed by the scarcity of surface measurements and the difficulty of achieving quantitative, highly resolved remote sensing products. An important gas-phase precursor of fine particulate matter, NH_3 is a significant factor for environmental, climatological, and human health concerns. However, despite playing an increasingly important role in relative contributions to particulate matter formation in many regions, NH_3 emissions remain highly uncertain, with large discrepancies between measured and modeled concentrations in recent studies.

In this work we present initial results from a mobile measurement campaign focused on the integration of surface observations with aircraft retrievals towards the goal of improved emissions inventories and chemical transport model performance. We show surface NH_3 measurements from around the south coast air basin of southern California during the summer of 2018 and compare these observations to modeled predictions using the Weather Research and Forecasting model coupled with chemistry (WRF-Chem). Together with retrievals from the airborne Hyperspectral Thermal Emission Spectrometer (HyTES) instrument, these surface emissions and inventories will be used to develop improved quantitative flux estimates and inventories, leading to more accurate model inputs and better representation of ammonia's human health impacts in Southern California.