

## Virtual ACOM Seminar

# Insights into hydroxyl variability from airborne observations of the remote troposphere

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**Links: <https://operations.ucar.edu/live-acom>**

### ABSTRACT

A dearth of constraints on the variability of the hydroxyl radical (OH), the primary methane sink, hinders attribution of methane trends and challenges our capacity to constrain models that project composition and climate. However, the low concentration and short lifetime of OH precludes the development of a representative measurement network. Here we assess formaldehyde (HCHO), an intermediate product of the methane and OH reaction, as a potential proxy for OH variability using novel observations of the remote troposphere from the NASA Atmospheric Tomography (ATom) aircraft campaign. We compare the OH-HCHO relationships in the high resolution, 10-s ATom observations with the GFDL AM3 chemistry-climate model simulated across hourly and daily averaging intervals at  $2^\circ \times 2.5^\circ$  resolution and sampled along the ATom flight tracks. By bridging spatiotemporal scales, we aim to contextualize the constraints offered by ATom for comparably coarse resolution global models. Overall, our analysis combines novel airborne data and global model simulations to improve our understanding of remote oxidant budgets toward improved projections of the role of methane in future composition and climate.

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