A11K-2709 - Reconciling Measured OH through Box Model Simulations during GoAmazon2014/5

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Moscone South - Poster Hall

Swirl Topics

Climate - SWIRL

Abstract

Hydroxyl radicals (OH) are important oxidants in the troposphere, controlling the lifetime of trace gases including methane, which is a greenhouse gas. The primary production of OH is from the photolysis of O_3. OH levels can be further sustained through HO_x-NO_x recycling reactions. Volatile organic compounds (VOC) react with OH to produce organic peroxyl radicals (RO_2), which can oxidize NO to NO_2, leading to O_3 production and subsequent re-generation of OH. However, in low NO_x and high VOC environments, OH levels can be limited due to the production of stable peroxides from reactions between peroxy radicals. Therefore, conventional chemistry predict constrained OH levels in remote forest regions. Observations of OH carried out in forests, however, have consistently reported up to 10-fold higher than expected OH levels. In this study, we report OH observations by chemical ionization mass spectrometry (CIMS) conducted in a rainforest environment during the GoAmazon2014/5 campaign. The measurements used in this study, were during the wet season (IOP1), at the T3 site, which was ~ 60 km west of Manaus, Brazil. OH observations are compared to observation constrained box model simulations embedded with a near-explicit chemistry like MCM 3.3.1 (Master Chemical Mechanisms) and condensed mechanisms like RCIM (Reduced Caltech Isoprene Mechanism), CB05 (Carbon Bond Mechanism), CB6r2 (Carbon Bond 6 Mechanism), RACM2 (Regional Atmospheric Chemistry Mechanism), and MOZART_T1 (Model for Ozone and Related Chemical Tracers) that are used in global models.

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