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Temporal and vertical variation of total OH reactivity in the Amazon rainforest

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Composition and chemistry of the troposphere impact air quality and climate. Particularly important for global budgets of trace gases and oxidants are the emissions from the largest contiguous terrestrial ecosystem in the world, the Amazon rainforest (ca. 5.5 million km^2). In the Amazon, strong biogenic volatile organic compounds (VOC) emissions driven by high light and temperature levels, act as major sink for the atmosphere's primary oxidant, the hydroxyl (OH) radical. Direct measurement of the total atmospheric OH sink, the total OH reactivity, can reveal insights into the coupling between biogenic emissions, atmospheric oxidation processes and the OH budget.

Total OH reactivity was measured at a remote tropical rainforest site in the Amazon (Amazonian Tall Tower Observatory (ATTO), S 2°08'38.8", W 58°59'59.5", 120 m above sea level, 150 km NE of the city of Manaus, Brazil) using the Comparative Reactivity Method (CRM) in November 2012 (end of the dry season). Vertical gradients were determined using measurements at 8 heights from the soil (0.05 m), inside the canopy (24 m) up to high above the canopy (79.3 m). Profiles of total OH reactivity will be presented for the first time showing the temporal and vertical variation of the total atmospheric OH sink term within the rainforest canopy and the lowermost 80 m of the tropical troposphere.