## Abstract

# Factors controlling the production of secondary organic material from isoprene epoxydiols (IEPOX) in the Amazonian wet season (GoAmazon2014/5)

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As part of GoAmazon2014/5, a high-resolution time-of-flight aerosol mass spectrometer (HR-ToF-AMS) was deployed to characterize the composition of fine-mode particulate matter (PM) and provide insights into the production of airborne particle material in the central Amazon basin, Brazil. Through a combination of meteorology, emissions, and chemistry, the T3 research site (located 70 km downwind of Manaus) was affected by biogenic emissions from the tropical rainforest that were periodically mixed with urban

outflow from the Manaus metropolitan area as well as with biomass burning plumes. Results from the T3 site are presented in the context of measurements at T0a (ATTO) and T2, representing predominantly clean and polluted conditions, respectively. At T3, in the wet season (1/Feb - 31/Mar 2014) the non-refractory PM1 mass concentration had values on order of 1 to 2 μg/m3, and the organic component was dominant, contributing 79% by mass.

The analysis of the results aims at delineating the anthropogenic impact on the measurements, especially focusing on the effect of anthropogenic sulfate and NOx emissions on the formation of organic PM. Positive matrix factorization (PMF) analysis is applied to the time series of organic particle mass spectra. The factors and their loadings provide information on the relative and time-varying contributions of different sources and processes of organic PM. An IEPOX-SOA factor, which is associated with secondary organic material produced from the reactive uptake of epoxydiols (a product of isoprene photooxidation under HO2-dominant conditions) is resolved. The time trend of this factor is investigated against co-located measurements, and compared between background and polluted conditions, toward the goal of improving the understanding of anthropogenic influences on the mass concentrations and composition of PM1.