



Isoprene flux estimates from airborne PTRMS measurements above the tropical rainforest during the Gabriel 2005 campaign

G. Eerdekens, J. Williams, T. Klüpfel, N. Yassaa, L. Ganzeveld, J. Lelieveld

Max Planck Institute for Chemistry, Mainz, Germany (eerdekens@mpch-mainz.mpg.de)

Tropical forest ecosystems are a strong source of biogenic volatile organic compounds to the atmosphere. The most important VOC emission in terms of amount and reactivity to OH is thought to be the unsaturated hydrocarbon isoprene, although other oxygenated compounds such as methanol and acetone are also released at currently poorly determined rates. Such emissions can profoundly impact the atmospheric oxidation capacity and need to be better characterized for chemistry in the region to be understood.

During the long dry season in October 2005, the chemistry in the atmosphere over a large part of the Amazonian rainforest (operational area: 6-3°N, 50-59°W) was intensively studied in the Guyanas Atmosphere-Biosphere exchange and Radicals Intensive Experiment with the Learjet (GABRIEL) project. Airborne PTRMS (Proton Transfer Reaction Mass Spectrometer) measurements of isoprene, its oxidation products methacrolein and methyl vinyl ketone, methanol and acetone were made, providing vertical (300m to 10 km) and diurnal profiles (08:00-16:00) for the rain forest which were compared with data derived from a single column model. From these diurnal profiles, an upper limit flux of 1.4 mg isoprene m⁻² h⁻¹ has been estimated which is approximately a factor 4 less than the modelled fluxes based on implementation the MEGAN database (Model of the Exchange of Gases between the Atmosphere and Nature (MEGAN)). The reasons why the perceived flux of isoprene determined empirically in the boundary layer are lower than expected are discussed.

This study reflects that the MEGAN model is not yet well characterized for acetone and methanol. The model simulates the observed morning (9:00-10:00) acetone mixing ratios quite good, but underestimates them in the afternoon (12:00-16:00). Simi-

larly, methanol mixing ratios are underestimated in the afternoon but overestimated in the morning. Reasons for these deviations are suggested.