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NON-REFRACTORY SUBMICRON AEROSOL COMPOSITION BEFORE AND AFTER MANAUS AS OBSERVED DURING GOAMAZON2014-5

Atmospheric chemistry and the coupling between biogenic and anthropogenic emissions

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The Amazon Basin, during the wet season, has one of the lowest aerosol concentrations worldwide, with air masses covering thousands of kilometers of pristine forest with negligible human impact. The atmosphere in such regions is strongly coupled with the biosphere through primary biological aerosols, biogenic salts and secondary aerosols from oxidation of biogenic VOCs. The natural environment is strongly modified nearby urbanized areas, in particular Manaus, a city of nearly two million people. The urban pollution plume has high concentrations of oxides of nitrogen and sulfur, carbon monoxide, particle concentrations, and soot, among other pollutants, strongly contrasting with the clean air masses reaching the city. Such unique location provides the ideal laboratory to study the isolated urban emission, as well the pristine environment by perturbing it in a relatively known fashion. The GoAmazon experiment was designed with these questions in mind, combining remote sensing, in situ and airborne measurements. This manuscript describes the measurements currently taking place upwind of Manaus, at the T0 site (the Amazonian Tall Tower Observatory, ATTO site) and at the T2site, near Manaus, frequently impacted by relatively fresh emissions from the city. This presentation focus on aerosol chemical speciation and size distribution from 15 February up to 13March 2014 at T0 site and 11-21 March2014 at T2 site. Initial results show comparable non-refractory submicron aerosol concentrations between the sites (0.59 µgm-3 and0.41 µgm-3 for T0 and T2, respectively), however, with large differences in the aerosol size distribution. At the T0 site, mean aerosol number concentration was 316 cm-3, with a mean geometric diameter of 127 nm. At T2 site, number diameter was over 5000 cm-3 with a mean geometric diameter of 45nm. Preliminary O:C ratio during the studied period was 1.1 and 0.6 at T0 andT2, respectively, indicating the well-processed nature of organic aerosols at T0site during the studied period. Such measurements will carry on throughout GoAmazon 2014/5, providing a unique dataset to understand the aerosol life cycle and the impact of urban

emission in the heart of the Amazon Forest.

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