

Preliminary characterization of submicron secondary aerosol in the amazon forest – ATTO station

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Biogenic secondary organic aerosol particles are investigated in the Amazon in the context of the GoAmazon Project. The forest naturally emits a large number of gaseous compounds; they are called the volatile organic compounds (VOCs). They are emitted through processes that are not totally understood. Part of those gaseous compounds are converted into aerosol particles, which affect the biogeochemical cycles, the radiation balance, the mechanisms involving cloud formation and evolution, among few other important effects. In this study the aerosol life-cycle is investigated at the ATTO station, which is located about 150 km northeast of Manaus, with emphasis on the natural organic component and its impacts in the ecosystem. To achieve these objectives physical and chemical aerosol properties have been investigated, such as the chemical composition with aerosol chemical speciation monitor (ACSM), nanoparticle size distribution (using the SMPS - Scanning Mobility Particle Sizer), optical properties with measurements of scattering and absorption (using nephelometers and aethalometers). Those instruments have been operating continuously since February 2014 together with trace gases (O₃, CO₂, CO, SO₂ and NO_x) analyzers and additional meteorological instruments. On average PM₁ (the sum of black carbon, organic and inorganic ions) totalized $1.0 \pm 0.3 \mu\text{g m}^{-3}$, where the organic fraction was dominant (75%). During the beginning of the dry season (July/August) the organic aerosol presented a moderate oxygenated character with the oxygen to carbon ratio (O:C) of 0.7. In the wet season some episodes containing significant amount of chloride and backward wind trajectories suggest aerosol contribution from the Atlantic Ocean. A more comprehensive analysis will include an investigation of the different oxidized fractions of the organic aerosol and optical properties.