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Observation of Nucleation Size Particles in the Amazon. FLORIAN DITAS, Christopher Pöhlker, Henrique Barbosa, Joel Brito, Samara Carbone, Xuguang Chi, Bruna A. Holanda, Isabella Hrabé de Angelis, Tobias Könnemann, Jing Ming, Mira L. Pöhlker, Maria Prass, Daniel Moran-Zuloaga, Marta Sá, Jorge Saturno, Hang Su, Jian Wang, David Walter, Stefan Wolff, Alessandro Araujo, Paulo Artaxo, Ulrich Pöschl, Meinrat O. Andreae, *Max Planck Institute for Chemistry, Mainz, Germany*

New particle formation (NPF) and subsequent growth of nanometer particles is on a global scale responsible for a substantial fraction of the total particle budget and the number of cloud condensation nuclei (CCN). Under pristine conditions, the particle contribution by NPF can be of particular significance when the activation of CCN to cloud droplets is mostly limited by the amount of available aerosol particles.

One of the few continental places to study atmospheric aerosols under near-pristine conditions is the Amazon rainforest. Here, we will present observations from the *Amazon Tall Tower Observatory* (ATTO) site, which is located about 150 km northeast of the city of Manaus. The ATTO site is equipped to measure microphysical, chemical, hygroscopic and optical particle properties well-above (325 m), close to (60 m) and below (5 m) the canopy.

Particle number size distributions inside and above canopy suggest, at least, two different types of new particle formation events or sources. In contrast to the well-established continental banana-like events, a large fraction of the observed events at ATTO features a burst-like character without subsequent growth.

These events, which are typically shorter than 1-2 hours, occur more often during the dry season and sporadically in the presence of fog. The burst-like character and the sharp gradients of particle number concentration might indicate local particle sources.

In contrast, a more regional increase of nucleation size particles is frequently observed during the wet season and, in combination with vertical transport, often related to convective rainfall. In this study we investigate different event classes of nucleation size particles, their sources and significance vertically resolved inside, close to and well-above the Amazon rainforest canopy.

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