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Natural biogenic aerosols in the Atlantic Forest and Amazonia: Impact on radiation balance, CCN production and optical properties

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Biogenic aerosols are a critically important component of the ecosystems in tropical and temperate forests in remote regions. They are a component that regulates radiation balance, cloud condensation nuclei properties and nutrient cycling. We have analyzed aerosol properties from 2 sites in Brazil: one in a remote region in Southern part of Brazil at the Atlantic Forest and a second site in Amazonia, near Manaus. Aerosol mass, size distribution, light scattering and absorption, CCN activity, elemental composition and other properties were analyzed for both sites. Biogenic aerosol mass are around 12 ug/m3 in both sites, with most of the mass in the coarse mode. Light absorption is low, with black carbon concentrations around 200-500 ng/m3. Total aerosol number concentrations are around 300 particles/cc, with 50-60% of the particles acting as cloud condensation nuclei for supersaturation around 0.5%. Aerosol composition is dominated by organic components (>60%), with very low sulfate and nitrate concentrations. Number size distribution peaks at 90 nm, with very few events of new particle production trough nucleation. Remarkable similarity of aerosol properties was observed for both primary forest sites.