



The haze of the Amazon region observed by airborne lidar during SAMBBA

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The South AMerican Biomass Burning Analysis (SAMBBA) campaign took place in Brazil in September and October 2012, involving the Facility for Airborne Atmospheric Measurements (FAAM) BAe-146 research aircraft. SAMBBA was aimed at investigating the properties of aerosols over South America during the dry season, when most of the deforestation and agricultural fires occur. Twenty research flights were carried out, and included the following aerosol measurements: physical, optical and chemical properties, as well as vertical distribution and mapping. Moreover, measurements of gas phase chemistry and fire radiative power were also carried out. This presentation focuses mainly on results obtained with the on-board lidar, putting them into context with data from other sources such as optical particle counters, dropsondes, and ground-based remote sensing.

An optically thick haze layer was observed during most flights. This layer tended to be elevated, often at an altitude of 1-3 km, with multiple thinner layers all the way up to 7 km. This atmospheric structure is believed to be the result of the interaction between smoke injected in the boundary layer and deep convective clouds often formed in the afternoon hours, with the potential of lifting aerosols quite high into the free troposphere.

Lidar observations also reveal smoke plumes originated from single fires, and allow to characterise them in terms of size and plume rise. Good cases of pyrocumulus are also revealed, rising some times from the ground up to altitudes of 6 km.