

Study of the mixing and ageing of polluted plumes from major West Africa cities

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Massive economic and population growth, fast urbanization in megacities along the Guinea Coast, would triple anthropogenic emissions by 2030 (Knippertz et al., 2015). Impacts of the rapid increase of atmospheric pollutants on weather and climate in this region are largely unstudied due to a lack of observations. The DACCIWA (Dynamics-aerosol-chemistry-cloud interactions in West Africa) project carried out an important airborne measurements campaign in June-July 2016 together with ground-based observations in urban and remote sites. Urban and industrial, biogenic dominated environment, dust and biomass burning air masses, ship plumes and flaring emissions were sampled successfully.

The goal of this work is to investigate the transport and ageing of anthropogenic emissions from major West African megacities during boreal summer. For this purpose, the coupled atmosphere-chemistry mesoscale model Méso-NH was run at kilometric scale and results were compared with in-situ meteorological and chemical data. The study focuses on 06-07-08 July 2016. Three research aircrafts operated over the coastal region sampling downwind pollution from Lomé and Accra and biogenic emissions further inland. Preliminary simulation results will be presented to understand the mixing between and ageing of cities plumes during the post-onset period of the campaign.