



Aircraft-based investigation of Dynamics-Aerosol-Chemistry-Cloud Interactions in Southern West Africa

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The EU-funded project DACCIWA (Dynamics-Aerosol-Chemistry-Cloud Interactions in West Africa, <http://www.dacciwa.eu>) is investigating the relationship between weather, climate and air pollution in southern West Africa. The air over the coastal region of West Africa is a unique mixture of natural and anthropogenic gases, liquids and particles, emitted in an environment, in which multi-layer cloud decks frequently form. These exert a large influence on the local weather and climate, mainly due to their impact on radiation, the surface energy balance and thus the diurnal cycle of the atmospheric boundary layer.

The main objective for the aircraft detachment was to build robust statistics of cloud properties in southern West Africa in different chemical landscapes to investigate the physical processes involved in their life cycle in such a complex chemical environment.

As part of the DACCIWA field campaigns, three European aircraft (the German DLR Falcon 20, the French SAFIRE ATR 42 and the British BAS Twin Otter) conducted a total of 50 research flights across Ivory Coast, Ghana, Togo, and Benin from 27 June to 16 July 2016 for a total of 155 flight hours, including hours sponsored through 3 EUFAR projects. The aircraft were used in different ways based on their strengths, but all three had comparable instrumentation with the capability to do gas-phase chemistry, aerosol and clouds, thereby generating a rich dataset of atmospheric conditions across the region. Eight types of flight objectives were conducted to achieve the goals of the DACCIWA: (i) Stratus clouds, (ii) Land-sea breeze clouds, (iii) Mid-level clouds, (iv) Biogenic emission, (v) City emissions, (vi) Flaring and ship emissions, (vii) Dust and biomass burning aerosols, and (viii) air-sea interactions.

An overview of the DACCIWA aircraft campaign as well as first highlights from the airborne observations will be presented.