



In situ size and optical properties of dust and biomass burning aerosol over Namibia during the 2017 AEROCLO-sA project

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The south-east Atlantic Ocean off the west coast of Namibia in southern Africa is a very unique environment with complex atmospheric processes that have wide-spread repercussions (Myhre et al., 2013). Low sea-surface temperatures off the coast are partially responsible for a semi-permanent stratocumulus cloud deck, an extremely effective cloud regime in reflecting short-wave radiation. Frequent upwelling of dust, lofting biomass burning plumes from extensive fires across southern Africa, marine aerosols and both urban and shipping pollution contribute to the aerosol burden in this region (van der Werf et al., 2010; Ginoux et al., 2012; Formenti et al., 1999; Rap et al., 2013).

The AEROCLO-sA (AErosols, RadiatOn and CLOuds in southern Africa) project was undertaken in August and September of 2017 with extensive aerosol in situ and remote sensing measurements from the PEGASUS mobile station at Henties Bay, Namibia, and on board the SAFIRE Falcon-20 across the Namibian land and coast. During this period, high concentrations of biomass burning aerosol transported from central Africa were observed within the troposphere and dust and sea salt was observed in the lower troposphere. These were observed in cloud-free regimes as well as below and above the cloud deck. This presentation will show the first results of aerosol size distributions and optical properties at the ground station and from the aircraft measurements during AEROCLO-sA.

In preparation for the future launch of the EUMETSAT Polar System - Second Generation launch of new satellites and remote sensing instrumentation, these in situ aerosol size and optical measurements will be used to validate retrieval products from recently developed algorithms that will utilize the remote sensing instrumentation. Finally, these measurements will be implemented within regional climate models to assist in the constraint of radiative forcing uncertainties.

References

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