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Characterization of marine boundary layer aerosols from in situ measurements in the framework of AEROCLO-sA

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The western coast of southern Africa off Namibia is characterized by a semi-permanent and widespread stratocumulus (Sc) cloud deck, very frequent coastal fog, and the oceanic northern Benguela upwelling system (nBUS). It is also the crossroad of large quantities of natural and anthropogenic aerosols of distant and local origins (biogenic, anthropogenic, biomass burning, sea salt and mineral dust) from continental and marine sources, with significant differences in terms of physico-chemical and optical properties, water affinity, scale and height of transport, which are not well represented in climate models.
The overarching objective of the AErosol, RadiatiOn and CLOuds in southern Africa (AEROCLO-sA) is to improve our knowledge about the role of aerosols on this regional climate with new observations and new climate model exercises.
AEROCLO-sA is based on a ground-based and airborne field campaign that was conducted in Namibia between 22 August and 12 September, 2017. Here we present the results of synergetic filter sampling, optical counting, scattering, absorption, extinction and hygroscopicity measurements that were conducted by the ground-based mobile PEGASUS at the coastal Henties Bay experimental site (22°6' S, 14°17' E) to characterize the marine boundary layer aerosols.
We illustrate examples of the numerous new particle formation events were observed during the field campaign in link with marine biogenic emissions. We illustrate the chemical composition of the submicron and total aerosols. We discuss the apportionment of maritime sulfate aerosols, and quantify their biogenic fraction, which we link with their cloud condensation nuclei and optical properties.