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Fog microphysics measurements during the Aerosols, Radiation and Clouds in southern Africa (AEROCLO-sA) field campaign in Henties Bay, Namibia

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Marine stratocumulus regimes along the western coast of continents (California, Southeast Pacific (Chile-Peru), and southwest Africa (Namibia-Angola) contribute directly to the Earth's energy budget due to their strong albedo and subsequent cooling effect, but their representation in large scale models and their evolution in our changing climate are still subject to large uncertainties. The AErosol RadiatiOn and CLOuds in Southern Africa (AEROCLO-SA) project focused on aerosol-cloud-radiation interactions along the Atlantic coast of austral Africa through airborne, ground-based and satellite measurements and use of global and regional models.
During the field campaign conducted in August/September 2017, an instrumented mobile station was implemented at Enties Bay over coastal Namibia in order to document the boundary layer aerosols and thermodynamics properties. In situ measurements of aerosol and cloud particles at ambient humidity were performed during the campaign to document the stratus/fog microphysics. A Welas-2000 from Palas measures the size distribution of particles from 0.8 to $\sim$20 μm in diameter. The FM-100 Fog Monitor from DMT provides the size distribution of droplets from $\sim$2 to 50 μm. In addition a PWD22 from Vaisala provides visibility measurements.
Analysis of these measurements will be presented. They reveal low values of the visibility due to sea spray depending on wind direction (on shore/off shore). In addition two main fog events (visibility < 1 km) occurred during nights on 9 and 10 September. Time evolution of the composite particle size distribution (Welas+FM-100) and integrated parameter such as droplet number concentration, LWC and effective diameter, will be discussed to document their microphysical properties. Comparisons with dry aerosol size distribution and CCN data will be performed to investigate links with activation/evaporation processes.