4.074 Southern Ocean Aerosols – a seasonal perspective from Macquarie Island.

Early Career Scientist

Presenting Author:
Ruhi S Humphries, Climate Science Centre, Oceans & Atmosphere, CSIRO, Aspendale, VIC, Australia, Ruhi.Humphries@csiro.au

Co-Authors:
Melita D Keywood, Climate Science Centre, Oceans & Atmosphere, CSIRO, Aspendale, VIC, Australia
Jason Ward, Climate Science Centre, Oceans & Atmosphere, CSIRO, Aspendale, VIC, Australia
James Harnwell, Climate Science Centre, Oceans & Atmosphere, CSIRO, Aspendale, VIC, Australia
George Brettingham-Moore, Bureau of Meteorology, Melbourne, VIC, Australia
Emry W Crocker, Bureau of Meteorology, Melbourne, VIC, Australia
Simon P Alexander, Australian Antarctic Division, Kingston, TAS, Australia

Abstract:

Being so far from anthropogenic activity, the Southern Ocean region is a unique environment that experiences the most pristine atmosphere in the world. This makes it a perfect testbed for understanding pre-industrial conditions that are so vital for reducing the uncertainties inherent in global climate and earth system models today (Carslaw et al., 2013). Clouds are of particular interest in this region because of the large biases in shortwave radiation and sea surface temperatures that are present in most models. However, due to its remoteness and wild environment, the Southern Ocean is one of the most under-sampled regions of the Earth's atmosphere, making high quality observational data from the region invaluable.
The recently concluded Antarctic, Clouds and Radiation Experiment (ACRE) included a two-year intensive measurement campaign that began in March 2016 at Australia's sub-Antarctic research station at Macquarie Island (54.6^{O}S, 158.9^{O}E). Amongst the suite of instrumentation deployed are those for the measurements of condensation nuclei (CN_{10}) and cloud condensation nuclei (CCN) which are vital components in the formation of clouds and determining their properties. In this presentation, the first climatological analysis of the dataset is presented and compared to previous measurements in the region as well as other long-term datasets around the globe.