

Environmental Drivers and Properties of Southern Ocean Aerosol and Cloud Formation

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Abstract

Antarctica and the Southern Ocean are considered among the last contaminated environments in the world, being very far from anthropogenic sources. Some studies have demonstrated that synoptic-scale pollution is already altering the natural balance and dynamics. For this reason, it is now necessary to deepen our understanding before these environments are further impacted. This work will focus on understanding the biological and meteorological drivers of aerosol composition and size over the Southern Ocean. To achieve this, we will analyze existing and new aerosol datasets over the Southern Ocean (e.g., RSV Aurora Australis, RV Investigator, RSV Nuyina) and at Kennaook/Cape Grim. The project will then focus on understanding how the aerosol size distribution varies under different environmental conditions. This will include investigating aerosol size variability under different synoptic types and air mass history over various oceanic conditions with different biological conditions that can influence the flux of aerosol and aerosol precursors. The outcome of this project will be an improved understanding of the drivers and processes that govern Southern Ocean aerosol and cloud formation and their role in climate, with opportunities to evaluate the simulation of aerosol properties in Earth System models, or to translate this knowledge into climate models improvements by providing observational constraints on aerosol size and composition properties.

Early Career Scientist

YES, I am an early career scientist.

IGAC Activities

CATCH: the Cryosphere and Atmospheric Chemistry, MAP-AQ: Monitoring, Analysis and Prediction of Air Quality, PACES: Air Pollution in the Arctic: Climate, Environment, and Societies, TOAR: Tropospheric Ozone Assessment Report

IGAC Regional Working Groups

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