



Aerosol Observations at high Southern Latitudes using an Instrumented Aircraft.

Tom Lachlan-Cope and Gillian Young

British Antarctic Survey, Cambridge, United Kingdom (tlc@bas.ac.uk)

Aerosols can have a big impact on the climate system through their interaction with incoming solar radiation and their impact on clouds. There is large uncertainty in size of the second of these processes. At high latitudes, particularly in the Southern Hemisphere, observations of aerosols are sparse. Here we report on observations of large aerosols (>0.5 micron) taken using the British Antarctic Survey Twin Otter Aircraft over the Antarctic Peninsula, the Weddell Sea and the Southern Ocean South of the Falkland Islands.

Although the observations were limited in time and they all took place during the Southern Summer, it is possible to identify the source of the aerosols in some cases. As the aircraft flew profiles from the surface up to around 3000m a variety of sources can be identified from local sources in within the boundary layer to more distant sources either further north in the Southern Ocean or from the pack ice in the central Weddell Sea within the free troposphere.

Some flights within the boundary layer explored the increase of aerosol as the fetch of the wind increased from the sea ice over open water. These flights meant that it is possible to calculate the flux of sea salt aerosol into boundary layer.

These observations are used to help explain the cloud observations made on the same flights (Lachlan-Cope et al., 2016) and show the importance of sea salt aerosols in these areas.

Lachlan-Cope, T., Listowski, C. and O'Shea, S.: The Microphysics of Clouds over the Antarctic Peninsula – Part 1: Observations, Atmos. Chem. Phys. Discuss., (May), 1–28, doi:10.5194/acp-2016-331, 2016.