

## **Black carbon in pristine environment: A study of two Hemispheres**

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Black carbon (BC) is the single most important absorbing species in the atmosphere emitted by combustion processes. Climatic implications of BC in warming the lower atmosphere highly depend on the dispersion and chemical complexity of the species. Marine environment is largely devoid of black carbon sources with the exception of shipping routes and thus ideal for studying background levels of BC.

Two intensive measurement campaigns have been undertaken in 2015: Southern Atlantic Ocean cruise around Antarctica and land based North East Atlantic measurement campaign at Mace Head, Ireland. BC measurements were performed by the single particle soot photometer SP2 alongside the suite of other aerosol parameters. SP2 was compared against MAAP and AE16 at Mace Head revealing significant departures in mass attenuation cross-section used in absorption based instruments. Size distribution of black carbon bearing particles was compared against SMPS spectrum informing about the long-term evolution of primary combustion particles.

During Southern Atlantic Ocean cruise and around western Antarctic Peninsula BC concentrations were below 1 ng/m<sup>3</sup> 75% of time during 6 week cruise. Similarly low BC concentrations of 1-2ng/m<sup>3</sup> were recorded in the cleanest North Atlantic air masses arriving at Mace Head. Observations strongly suggest that pristine environments do exist in certain regions over the globe despite generally assumed polluted atmosphere worldwide.

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