



Iodine Monoxide in the Antarctic Marine Boundary Layer: Recent Discoveries

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Iodine monoxide (IO) is thought to play an important role in the chemistry of the Antarctic marine boundary layer (MBL). Produced either by organic precursors or by inorganic processes, large areas of enhanced IO were detected by satellite not only around the coast of Antarctica, but also over the continent far from the coastal source regions. In the past, several active and passive remote sensing measurements at coastal stations confirmed the presence of IO, which is expected to have a significant impact on the oxidative capacity and the ozone budget in the MBL.

We present a summary of recent findings regarding IO in the Antarctic MBL, with a focus on two measurement campaigns conducted at the German Research Station Neumayer (70°S, 8°W), the New Zealand Station Scott Base (177°E, 78°S) and in the marginal sea ice zone of the Wedell Sea onboard the German research vessel Polarstern in austral summer 2011, spring 2012, and winter/spring 2013, respectively. During all three campaigns, IO was measured using a combination of active and passive DOAS remote sensing instruments, including a newly developed mobile open-path cavity-enhanced DOAS instrument.

Satellite measurements indicate that the area around Scott Base in the Ross Sea, but also the marginal sea ice zone, are subject to particularly high levels of IO. However, in contrast to previous ground-based and satellite borne observations, we find surprisingly low IO concentrations at Neumayer, Scott Base and in the marginal sea ice zone, with IO being below the detection limit (< 0.5 ppt) of the active DOAS instruments at all times. This raises the question to what extent IO is of importance for the chemistry of the Antarctic MBL.