Isoprene hotspots at the Western Coast of Antarctic Peninsula during MASEC ' 16

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Abstract

Isoprene (C5H8) plays an important role in the formation of surface ozone (O3) and the secondary organic aerosol (SOA) which contributed to the climate change. This study aims to determine hourly distribution of tropospheric isoprene over the Western Coast of Antarctic Peninsula (WCAP) during the Malaysian Antarctic Scientific Expedition Cruise 2016 (MASEC'16). In-situ measurements of isoprene were taken using a custom-built gas chromatography with photoionization detector, known as iDirac. Biological parameters such as chlorophyll a (chl-a) and particulate organic carbon (POC) were compared to the in-situ isoprene measurements. Significant positive correlation was observed between isoprene and POC concentrations ($r2 = 0.67$, $p < 0.001$), but not between isoprene and chl-a. The hotspots of isoprene over maritime Antarctic were then were investigated using NAME dispersion model reanalysis. Measurements showed that isoprene mixing ratio were the highest over region of King George Island, Deception Island and Booth Island with values of similar to 5.0, similar to 0.9 and similar to 5.2 ppb, respectively. Backward trajectory analysis showed that air masses may have lifted the isoprene emitted by marine algae. We believe our findings provide valuable data set of isoprene estimation over the under sampled WCAP.

Keywords

Author Keywords: Isoprene; Antarctic peninsula; Marine algae
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