NCAR | ATMOSPHERIC CHEMISTRY OBSERVATIONS & MODELING

Virtual ACOM Seminar

Observations of novel marine trace gases across the North Atlantic Ocean

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Links: https://operations.ucar.edu/live-acom

ABSTRACT

The deployment of high-resolution instruments into the field are allowing for more and more novel species to be identified. Here, we present the first observations of gas-phase urea ($CO(NH_2)_2$) in the atmosphere from airborne high-resolution mass spectrometer measurements over the North Atlantic Ocean. We show that urea is ubiquitous in the marine lower troposphere and find that the ocean surface is the primary emission source. These observations alongside global model simulations point to urea being an important, and as yet unaccounted for, component of reduced-N to the remote marine environment where it could impact ecosystems and oceanic uptake of CO2, with potentially important atmospheric implications. We also present observations of the recently discovered dimethyl sulphide (DMS) oxidation product, hydroperoxy methylthioformate (HPMTF). Our results greater extend on the original atmospheric observations by Veres et al., (2020) and support that HPMTF is a major intermediate in the oxidation of DMS and questions our understanding of the cycling of marine sulphur.

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