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Characterization of the dimethylsulfide (DMS) and isoprene distribution in the eastern Atlantic Ocean using nutrient availability

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Continuous underway measurements of dimethylsulfide (DMS) and isoprene in the ocean surface layer were conducted from Germany to South Africa in November 2008. Significant correlations between DMS, total dimethylsulfoniopropionate (DMSPt) and isoprene were observed in nitrogen depleted regions when the samples were clustered by nitrogen to phosphorous ratio (N:P). The phytoplankton group haptophyte appears to be a common source of these compounds in the low N:P regions. Additionally, DMS and isoprene correlated in nitrate depleted regions when they were clustered against nitrate concentrations. Significant correlations between DMS and isoprene were also found within nitrate depleted (<0.1 μmol L-1) eddies encountered along the cruise track. Eddies with N:P of $\sim$2.8 showed the highest positive correlations between DMS and isoprene, while a nitrate depleted eddy showed a high anti-correlation. We conclude that the DMS/isoprene relationships in the eastern Atlantic Ocean were influenced by nutrient availability and partly by mesoscale eddy structures, with implications for using nutrients to predict the trace gas concentrations over a range of oceanographic areas depleted in nitrogen.