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What can we learn about small-scale spatial variability of surface ocean dimethylsulfide (DMS) concentrations from high frequency novel measurements?

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Analysis of new high frequency dimethylsulfide (DMS) measurements indicates a latitudinal dependence to the patterns of small-scale variability; this points to previously unrecognised drivers of DMS spatial variability. DMS makes a significant contribution to natural marine aerosol. The amount and distribution of preindustrial DMS emissions is important for constraining the influence of anthropogenic aerosol on climate. The impact of variations in seawater DMS concentration on climatological (Lana et al. 2011) flux uncertainty is as large as the choice of gas transfer velocity parameterization. Improving understanding of the spatial variability of seawater DMS will help improve climatological flux estimates. High frequency data enables an assessment of the spatial variability lengthscale of DMS. We use 35 high frequency observational datasets, including measurements from the GSSDD (Global Surface Seawater DMS Database), NAAMES (North Atlantic Aerosol and Marine Ecosystem Study), and SCALE (Southern oCean SeAsonaL Experiment), to assess the variability lengthscale of DMS globally, and in all ocean basins at different stages of the seasonal cycle. We interpret our results within the context of ancillary physical and biogeochemical measurements, which may be potential drivers of the regional variability patterns of DMS concentrations.