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Source regions of stratospheric VSLS in the Indian Ocean

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Halogenated very-short-lived substances (VSLS), which are naturally produced in the ocean, play a significant role in present day ozone depletion, in particular in combination with enhanced stratospheric sulfate aerosol, which is also partly derived from oceanic VSLS. The decline of anthropogenic chlorine in the stratosphere within the 21st century will increase the relative importance of the natural emissions on stratospheric ozone destruction. Especially, oceanic sources and source regions of the compounds need to be better constrained, in order to improve the future prediction. During boreal summer the Asian monsoon circulation transports air masses from the Indian Ocean to the stratosphere, while the contribution of VSLS from this ocean to stratospheric halogen and sulfur is unknown. During the research cruises SO 234/2 and SO 235 in July-August 2014 onboard RV SONNE oceanic and atmospheric halogenated VSLS such as bromoform (CHBr3), dibromomethane (CH2Br2) and methyl iodide (CH3I) were measured in the subtropical and tropical West Indian Ocean for the first time. Here we present the oceanic sources of the halogenated compounds and their relation to other biogeochemical parameters (short- and longlived trace gases, phytoplankton and nutrients) along the cruise track, which covered coastal, upwelling and open ocean regimes and the Seychelles-Chagos thermocline ridge as important source region for stratospheric bromine.