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Halocarbon distributions and emissions in the western tropical Pacific during the SHIVA SONNE expedition in November 2011

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Marine brominated and iodinated halocarbons participate in catalytic ozone destruction and aerosol formation in the troposphere and they also have a significant impact on stratospheric ozone. While the tropical oceans are a known source of these very short lived substances (VSLS), including e.g. bromoform ($CHBr_3$) and methyliodide (CH_3I), the tropical Western Pacific waters are largely uncharacterized for these compounds. Coastal macro algae, regionally enhanced phytoplankton abundance, photochemical reactions and local anthropogenic sources are expected to contribute to strong marine emissions. As high convective activity with fast efficient uplift takes place throughout the year, the western Pacific is projected to be a hot spot for oceanic VSLS supply to the stratosphere.

In this study, we present first results from the SHIVA Sonne expedition to the South China Sea during November 2011. The research cruise was embedded within the framework of the EU-project SHIVA (Stratospheric ozone: Halogen Impacts in a Varying Atmosphere). During the cruise we investigated the large variability of the VSLS concentrations in both ocean and atmosphere using several methods, including in-situ atmospheric measurements, air canister sampling, purge and trap gas chromatography with electron capture and mass spectrometric detection. We will intercompare the results from various methods and present highlights from the expedition including atmospheric and oceanic VSLS data, as well as first estimates of emissions.