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Impact of the marine boundary layer on atmospheric VSLS abundances?

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Recent observations of very short lived halocarbons at the area around the Mauritanian upwelling (e.g. Quack et al., 2007; O'Brien et al., 2009), revealed increased abundances in the marine atmosphere, suspecting regionally enhanced biogenic production in the water column and additionally terrestrial sources. In this study, we want to investigate potential influences of meteorological parameters on atmospheric halocarbon abundances in the Mauritanian upwelling region. Low sea surface temperatures, due to the transport of deeper colder water to shallow levels in this area, create intense surface air temperature inversions. These inversions downsize the height of the marine atmospheric boundary layer (MABL). In May to June 2010 air samples for the determination of the VSLS mixing ratios have been taken during the DRIVE (Diurnal and Regional Variability of Halogen Emissions) ship campaign in the tropical East Atlantic. The aim of this expedition was to investigate the diurnal variability of the halocarbons at six 24h-stations, over open waters and close to the Mauritanian coast. These measurements are compared to several meteorological parameters, and in particular to the according MABL height, as derived from daily radiosonde launches taken on board. High anti correlations are determined, revealing a distinct relation between atmospheric VSLS mixing ratios, especially the bromocarbons, and the observed MABL height (Fuhlbrügge, 2011). It is therefore important to examine, not only the sources, but also the conditions in the lower troposphere, especially the MABL, for evaluating variations of halocarbon mixing ratios. In addition, observations from two ship expeditions in the tropical West Pacific: TransBrom SONNE (October 2009) and SHIVA SONNE (November 2011, South China Sea), are compared to the DRIVE campaign.