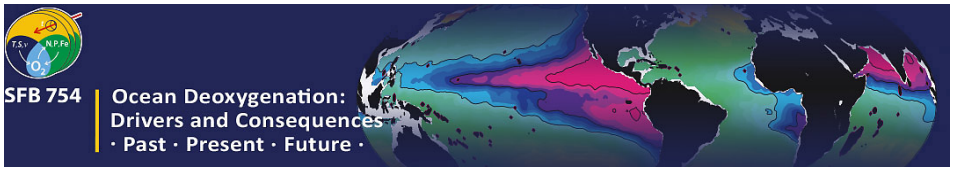

Contribution ID : **122** Type : **Oral**

Measurements of biogenic volatile organic compounds (BVOCs) in marine boundary layer of Arabian Sea (OMZ): Role of carbon cycle in pre-monsoon season

Tuesday, 4 September 2018 17:30 (15)

Global oceans play important role as a sink of atmospheric carbon dioxide (CO2). Dissolved organic carbon (DOC) in the sea waters is an important source of many biogenic volatile organic compounds (BVOCs). Globally, BVOCs are emitted from plants and organism from both terrestrial and oceanic reservoirs. However, spatial and temporal variations in emission and factors controlling production of BVOCs in oceanic regions are poorly understood. Therefore, the reported estimates of a global oceanic flux of reactive carbon species contain great uncertainties. BVOCs play important role in the enhancement of oxidants and climate change. Northern tropical Indian Ocean is expected to be a strong source of many BVOCs due to relatively high productivity (phytoplankton). Arabian Sea is one of the most productive regions of the world where studies of BVOCs emissions from sea waters are scarce. The present study is based on the measurements of BVOCs including alkenes and isoprene in the marine boundary layer of Arabian Sea during a cruise campaign onboard Sagar Sampada #19 from 18 April to 02 May 2017. The objective is to determine the relation between the emissions of oceanic VOCs (particularly isoprene) with phytoplankton in surface sea waters of the Arabian Sea. The concentrations of BVOCs were measured using a thermal desorption-gas chromatography with a flame ionization detector (TD-GC-FID) instrument. The concentrations of isoprene over open and coastal regions were 0.47±0.13 and 0.80±0.18 ppbv, respectively. However, we do not find significant differences in key meteorological parameters such as temperature and solar radiation observed over both regions of Arabian Sea. Therefore, large gradient and heterogeneity in fluxes of BVOCs could be mainly controlled by the distribution of DOCs in the pre-monsoon season. In consistent with distribution of isoprene concentration the satellite based ocean color map (chlorophyll concentration) shows much higher productivity in coastal regions compared to open oceanic region. The spatio-temporal variation of BVOC is consistent as the high primary production which could cause low surface pCO2 and higher DOCs observed over the Arabian Sea. This result is an important for further understanding of different processes controlling the oceanic emissions of alkenes from the oxygen minimum zone (OMZ) of tropical Indian Ocean. A detailed result of different BVOCs including their latitudinal dependence and role of biogeochemistry in view of carbon cycle over Arabian Sea will be presented.

Position

Professor

Affiliation

Physical Research Laboratory, Ahmedabad, 380009, India

Email Address

lokesh@prl.res.in

Are you a SFB 754 / Future Ocean member?

No

Primary author(s) : Dr SAHU, Lokesh Kumar (PRL)

Co-author(s) : Ms TRIPATHI, Nidhi (PRL)

Presenter(s) : Dr SAHU, Lokesh Kumar (PRL)

Session Classification : 05 Major Upwelling Systems

Track Classification : 05 Major Upwelling Systems