Physical Research Laboratory

Tuesday Seminar

Speaker: Dr. Subha Anand S
Scientist, CSIR-NIO

Date & Time: 13th October, 2020 @ 16:00 Hrs

Venue: Online Platform (Google Meet)

Title: Understanding and Quantifying the Biological Carbon Pump in the Indian Ocean using naturally occurring radionuclides in seawater as tracers

Abstract

Ocean acts as a significant reservoir of carbon on the earth's surface. Tiny photosynthetic organisms, the phytoplankton, present in the sun-lit layers of the ocean accounts for about 50% of the global net primary production. The process by which phytoplankton photosynthetically fixes atmospheric CO_2 and produces particulate organic carbon that sinks from sea surface to bottom and remains stored for longer time scales is termed as the biological carbon pump. The efficiency of the biological carbon pump is determined by the ratio of the amount of organic carbon sinking below the euphotic depth to that produced. This efficiency can be determined by using particle reactive radionuclides present in seawater. Particle reactive radionuclide approach is considered to be more advantageous because of the natural occurrence, specific half-life, continuous decay and secular equilibrium. My research work in the Bay of Bengal, Arabian Sea and the Indian Ocean, focuses on (1) estimating the particulate organic carbon (POC) export flux from monthly to seasonal time scales using the particle reactive radionuclide pairs, $^{234}Th/^{238}U$ and $^{210}Po/^{210}Pb$. (2) The role of vertical eddy diffusive mixing in enhancing nutrient concentrations in the surface waters from sub-surface depths using Radium isotopes (^{228}Ra and ^{226}Ra) (3) Quantifying lithogenic inputs to the ocean and palaeo particle flux using ^{232}Th, ^{230}Th and ^{231}Pa isotopes (4) Comparison of measured primary production and estimated POC export flux with that of the globally existing empirical models with an approach to develop a model for the Indian Ocean.

The Speaker

Dr. Subha Anand is currently working as a Scientist at the Integrative Oceanography Division, CSIR-National Institute of Oceanography, Goa from October 2019. Dr. Anand had worked as a Project Scientist at the National Centre for Polar and Ocean Research, Goa, from March 2018 to September 2019, under the research programme Pliocene Arctic Climate Teleconnections (PACT) after completing his PhD work at Geosciences Division, PRL. He is interested in working on understanding and estimation of strength of the biological carbon pump in the Indian Ocean including the Bay of Bengal and the Arabian Sea using naturally occurring U-Th series radionuclides present in seawater. Dr. Anand's earlier work forms a part of the major programmes like GEOTRACES and SIBER. He has published his research findings in well reputed scientific journals and his results were highlighted in the international GEOTRACES webpage. He has received recognitions, grants and support from DST, SCOR and GEOTRACES. For his research work, he has participated in several multi-disciplinary oceanographic cruises onboard ORV SAGAR KANYA

All are invited to attend and participate in discussion

A .K. Sudheer. Geosciences Division