

Sagar Manjusha Cruise, SAMA11/2016

09-15 May, 2016

Sagar Manjusha started sailing from Chennai port on 09th May for a 7 day cruise in Bay of Bengal. Total science crew in this cruise (SM11/2016) is 9 which include 2 scientists from INCOIS, 4 VMC representatives and 3 seamen.

1. Objectives and Cruise Outline

Main objectives of the 7 day cruise are

- a) Deployment of 2 Lagrangian Floats
- b) Deployment of 2 EM APEX argo floats

Lagrangian floats (L Floats) are autonomous floats which follow water parcels and make measurements. We plan to deploy two custom made L floats during this cruise, one belongs to INCOIS and the other belongs to University of Washington. INCOIS L Float is outfitted with 3 CTD sensors, an upward looking 600 kHz ADCP, and PAR sensors. The temperature, salinity and density observations from the CTD and current profiles from the ADCP will help to study the upper ocean stability and mixing. This float will be retrieved in a later cruise. The second L Float is having only CTD sensors and PAR observations. This will be deployed for measuring the upper ocean variability during the monsoon.

EM APEX floats are a variety of argo floats but outfitted with sensors for measuring currents. The special sensors fitted with these instruments measure the velocity of water parcels while profiling. The main difference between L Floats and EM APEX is that L Floats are drifting floats while EM APEX are profiling floats. Both instruments measure temperature, salinity, density and currents which are required for the upper ocean stability studies, but provide the same data in different perspectives.

Our plan is to deploy one Lagrangian Float (L Float) close to NIOT's BD11 mooring location (13.5°N,84°E) and another one at the centre of an downwelling eddy in the north Bay of Bengal.

Reason for selecting BD11 for the first deployment is to obtain the meteorological data from the mooring to compare with the subsurface observations from the L float. The second L Float was decided to deploy at the centre of a strong upwelling eddy in the northern Bay to make sure that it won't drift too far away before the monsoon arrives. EM APEX floats are custom made for locations. We plan to deploy one EM APEX at the second L Float location to obtain concurrent observations. While the second EM APEX is decided to deploy along 14.5°N latitude.

2. Cruise track, Operations and Timeline

2.1 Cruise track

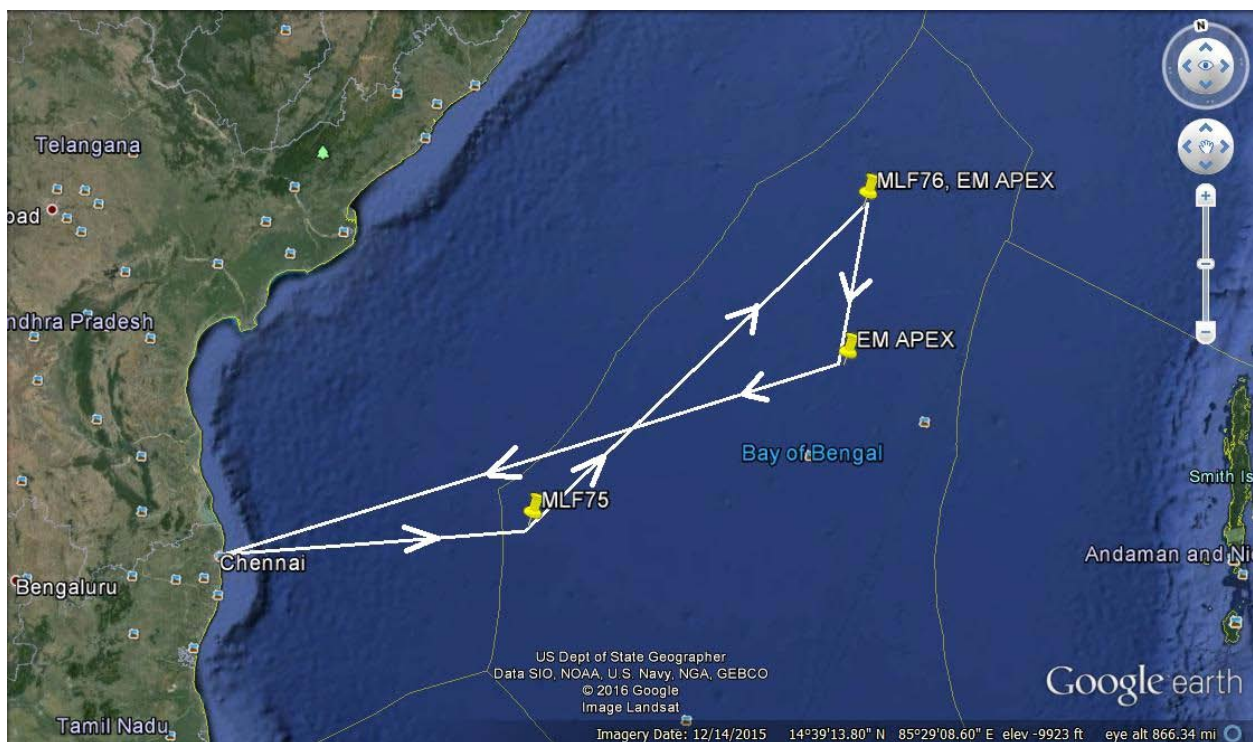


Figure 1: Cruise track of SAMA11/2016

2.2 Operations

2.2.1. Lagrangian Float deployments

We reached the first L Float location (13°29' N, 83°56' E) on 10th May late evening at 20:30 hours. A CTD cast was done upto 500m. L Float was made ready for deployment by doing a last minute checking of sensors and engine. Since all tests went well, it was decided to deploy

the float by 22:30. Port side crane was used to lift the float for deployment. By 22:50 hours the float was in water, and deployed. We waited at the location for another 2 hours to get the first GPS fix from the float. Once the first signal was received at the shore station, ship started sailing to the next L Float location in northern Bay.

On 12th May at 11:00 hours, ship reached the second L Float location (16°23' N. 88°36' E). Float behaved well to all the sensor and engine tests. First a CTD cast was done upto 500m. This was then followed by the L Float deployment. Portside crane was again used for this operation. By 13:20 hours, float was at water. First signal from the float was confirmed within one and half hours.

2.2.2. Argo deployments.

A total of 2 EM APEX argo floats were deployed during this cruise. The details of the argo floats deployed and its locations are given in the table below:

| Sr. No | Float ID | Model Name | Deployed at | | Deployed on |
|--------|----------|------------|-------------|-----------|--------------------------|
| | | | Latitude | Longitude | |
| 1 | 7559 | APEX-APF91 | 16° 21' N | 88° 37' E | 12/05/2016 16:39 hrs IST |
| 2 | 7560 | APEX-APF91 | 14° 30' N | 87° 59' E | 13/05/2016 13:05 hrs IST |

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