

ORV - SAGAR KANYA

CRUISE REPORT

Cruise No. SK - 347

(03rd April – 13th April, 2018)

Submitted by

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Objectives:

Diurnal variability of vertical distribution of small scale turbulence

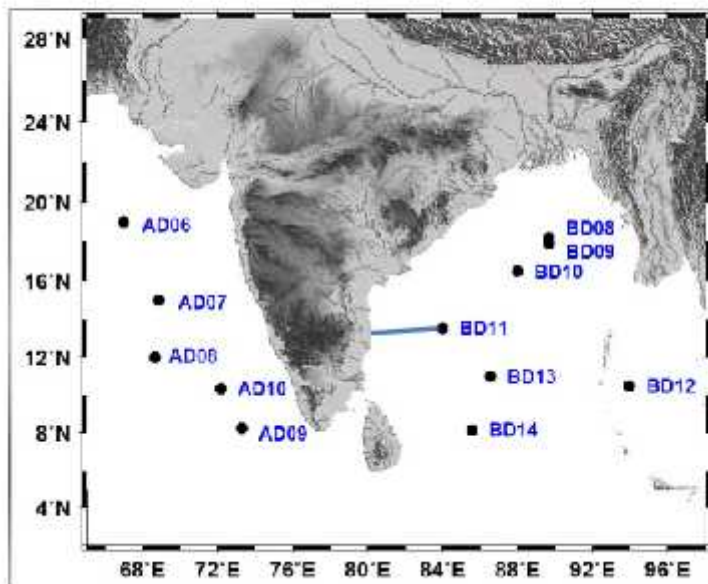
Primary objective is to provide a detailed description of the vertical distribution of small-scale turbulent characteristics in diurnal time scale in the northern Bay of Bengal and northern Arabian Sea during different season. The variation of the vertical distribution of small-scale turbulent characteristics with respect to variable background stratification and different forcing regime, Moreover, we planning to verify the performance of frequently used parameterization (e.g., KPP) using VMP measurements.

Diurnal variability of vertical distribution of small scale turbulence budget during different season, diffusion coefficient (K_T and K_S) and diffusive flux estimated from the residual of mixed layer heat and salt budgets will be validated with VMP measurements and if it is satisfactory we are planning to extent the analysis to other mooring location which may give spatio-temporal variability of these parameters.

Cruise Track:

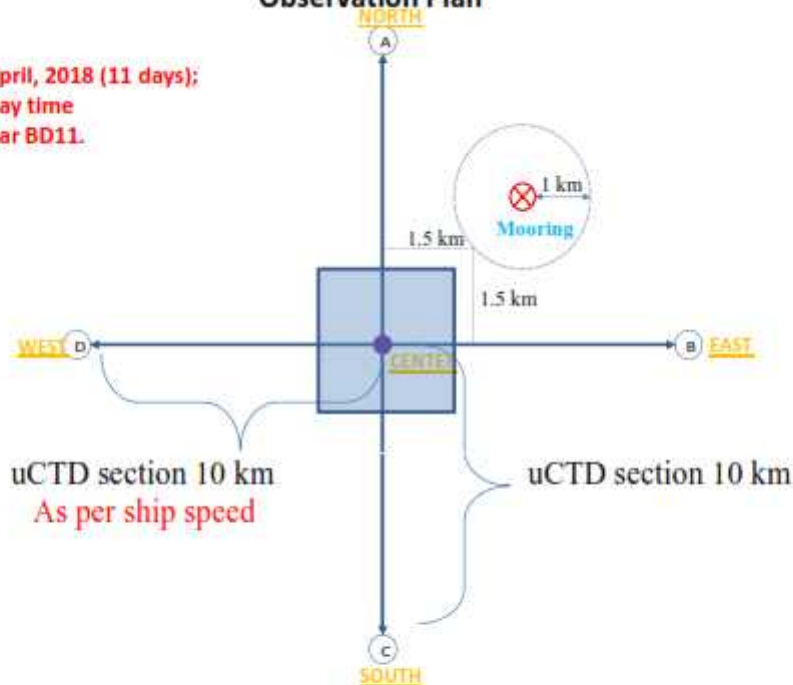
Cruise track and time series measurement station (BD11)

We have to repeat same field survey we did in Arabian Sea during winter 2018



Observation Plan

The cruise will be 3-13 April, 2018 (11 days);
3 day for transit and 8 day time series measurements near BD11.



- VMP time measurements in every three hour (IST): 3-6-9-12-3-6-9-12. (measurements in ship in drift mode.)
- Each cast consists of 5 profiles (~300 m). (E.g. 2 P.M Cast will start from 1.30 P.M to 2.30 P.M.
- After each cast will make a uCTD transect to the center (e.g. After 2.30 P.M ship will move to EAST and comeback with a uCTD survey from EAST to Center.): 3-E-6-W-9-N-12-S-3-E-6-W-9-N-12-S-3-E.....
- Radiometer between 10 A.M-2 P.M. (not yet finalized).

The total distance covered will be approximately 430 nm. At an assumed ship speed of 6 knots, the time required for the total transit is 03 days. 7 days are required for the VMP measurements at BD-11 NIOT mooring site and one BIO-Argo deployment with CTD collections.

Scientific Participants SK-297

Sr. No.	Name of Participants	Designation	Institute	Nationality
1	NEELAKANDAN SURESH KUMAR	CH. SCIENTIST	INCOIS	Indian
2	VARADAN P.THANGAPRAKASH	SCIENTIST	INCOIS	Indian
3	ASHOK KUMAR	ASSISTANT	INCOIS	Indian
4	EMAYAVARAMBAN SELVARAJ	Depl. Asst.	INCOIS	Indian
5	THIVAKAR SANKAR	Depl. Asst.	INCOIS	Indian
6	UDHAYAKUMAR RAJI	Depl. Asst.	INCOIS	Indian
7	JAGAN KUMAR	Depl. Asst.	INCOIS	Indian
8	MOHAMMAD ISMAIEL	FACULTY	Univ Of Hyderabad	Indian
9	FOUSIYA T.SHAHULHAMEED	RESEARCH ASSOCIATE	Univ Of Hyderabad	Indian
10	NAIR ARUN	STUDENT	Univ Of Hyderabad	Indian
11	BEENY MARIYA	STUDENT	Univ Of Hyderabad	Indian
12	DAS RIPAN	STUDENT	Univ Of Hyderabad	Indian
13	CHERIAN POUL	STUDENT	Univ Of Hyderabad	Indian
14	THAMMATTAN MUHAMMED RAYEES	STUDENT	Univ Of Hyderabad	Indian
15	SAILO REUBEN LALCHHANDAMA	STUDENT	Univ Of Hyderabad	Indian
16	BALA LAXMAN MHADGUT	Scientific Assistant	NCAOR	Indian
17	ANANTHA KRISHNAN	Project tec. Assistant	NCAOR	Indian
18	RANGANATHAN VINOTHKUMAR	AMC SER.ENG.	NORINCO	Indian
19	MUTHURAMALINGAM MANIVANNAN	AMC SER.ENG.	NORINCO	Indian
20	MURUGAN VELKUMAR	AMC SER.ENG.	NORINCO	Indian

SK-347, Cruise Diary Events

Day-1, 03-April-2018

- 11:00 hrs. Science team boarded successfully, all the embarkation formalities completed.
- 12:00 VMP fabrication – fixing of Davit frames and winch base were completed.
- 23:00 hrs. Vessel departure is scheduled.

Day-2, 04-April-2018

- 01:00 hrs. Vessel started sail out towards first waypoint of ARGO deployment locations.
- ETA for 1st location is scheduled for 06_April, morning 10:00 hrs.
- 11:00 hrs. Meeting with Captain and discussed the cruise plan.
- 16:15 hrs. Cruise General Safety drill was conducted.
- 21:00 hrs. Bio Argo Float tested and set ready for deployment.

Day-3, 05-April-2018

- 18:00 hrs. The Bio Argo Float deployed in position @ Lat: 13 29.91N | long: 83. 51.29 E
- 22:00 – 23:30 hrs., first VMP (Vertical Microstructure Profiler) cast taken up to 250-300 meter, during the deployment the surface currents were too strong and the VMP rope went under the ship hull, by altering the ship heading the wire lead is corrected and complete the operations successfully.
- Science team divided in to two teams (A& B) and followed the shift timings.
- Vsl headed to East Section.

Day-4, 06-April-2018

- 01:30-02:30 hrs. VMP cast for up to 250 meter done.
- 04:30-05:30 hrs. VMP cast for up to 250 meter done.
- During VMP operations we experienced strong currents, from ADCP and ship drift it's read as 2.5 knots.
- Sudden unexpected issues from ship main engine the VMP operation got hold and postponed.
- 09:30 -10:30 hrs. VMP cast for up to 250 meter done.
- 12:00-13:00 hrs. The VMP operated, due the strong surface current the VMP wire got entangled and VMP rope cut with ship stern propellers or Ruder???, moments later the terminated rope visualized in port quarter stern, can say it damn very lucky and good luck with us by that time, with good team work and planned execution, we successfully retrieved the VMP and return to on-board.
- Science team resumed the VMP operation.
- 01:30-14:30 hrs. VMP cast for up to 250 meter done.
- 17:00-18:30 hrs. VMP cast for up to 250 meter done.
- In the event of strong surface currents and incident occurred, science team decided to operate the VMP coasting in day light in following timings (6,9,12,15&18 hours).

Day-5, 07-April-2018

- @.5:30-07:30 hrs. VMP casting executed, the ship heading was adjusted according the current drift and successfully finished the observation.
- Vsl headed to East Section.
- 09:15 -10:30 hrs. VMP cast for up to 250 meter done.
- 12:00 -13:30 hrs. VMP cast for up to 250 meter done.
- 14:30-15:30 hrs. VMP cast for up to 250 meter done.
- 17:30-18:30 hrs. VMP cast for up to 250 meter done.
- 21:00-23:30 hrs. AWS cross verified with BD-11, ship went close the buoy location 3 cables nautical miles distance.

Day-6, 08-April-2018

- 07:30 -08:30 hrs. VMP cast for up to 250 meter done.
- Science team decided and planned to do execute 24 hours VMP sampling for every 3 hours casting round the clock for next 4 days.
- 10:30-11:30 hrs. VMP cast for up to 250 meter done.
- 11:30-14:00 hrs. Ship Seabird CTD coast taken for depth 300meters, due to strong surface currents the coasting got delayed and ship heading altered to perform the CTD.
- 14:00-15:15 hrs. VMP cast for up to 250 meter done.
- 19:30-20:30 hrs. VMP cast for up to 250 meter done.
- 22:30-23:30 hrs. VMP cast for up to 250 meter done.

Day-7, 09-April-2018

- 01:30-02:30 hrs. VMP cast for up to 250 meter done.
- 04:30-05:30 hrs. VMP cast for up to 250 meter done.
- 07:30-08:30 hrs. VMP cast for up to 250 meter done.
- 10:30-11:30 hrs. VMP cast for up to 250 meter done.
- 13:30-14:30 hrs. VMP cast for up to 250 meter done.
- 17:00-18:00 hrs. VMP cast for up to 250 meter done.
- 19:30-20:30 hrs. VMP cast for up to 250 meter done.
- 22:30-23:30 hrs. VMP cast for up to 250 meter done.

Day-8, 10-April-2018

- 01:30-02:30 hrs. VMP cast for up to 250 meter done.
- 04:30-05:30 hrs. VMP cast for up to 250 meter done.
- 07:30-08:30 hrs. VMP cast for up to 250 meter done.
- 10:30-11:30 hrs. VMP cast for up to 250 meter done.

- 13:30-14:30 hrs. VMP cast for up to 250 meter done.
- 16:30-17:30 hrs. VMP cast for up to 250 meter done.
- 19:45-20:45 hrs. VMP cast for up to 250 meter done.
- During the voyage we had severe EVAC problem, most of days especially morning hours the EVAC has stop functional. Ship officials fixing the issues.
- 22:30-23:30 hrs. VMP cast for up to 250 meter done.

Day-9, 11-April-2018

- 01:30-02:30 hrs. VMP cast for up to 250 meter done.
- 04:30-05:30 hrs. VMP cast for up to 250 meter done.
- 07:30-08:30 hrs. VMP cast for up to 250 meter done.
- 10:30-11:30 hrs. VMP cast for up to 250 meter done.
- 13:30-14:30 hrs. VMP cast for up to 250 meter done.
- 16:30-17:30 hrs. VMP cast for up to 250 meter done.
- All operation is successfully completed and advised wheel house/bridge to proceed full ahead to Chennai.

Day-10, 12-April-2018

- Vessel propelling towards Chennai and ETA is 13_April morning 07:00 am hours.
- The students from University of Hyderabad had given their presentation in conference room which they got learned and experienced during this voyage. Based on the performance the internal marks issued.
- Flowed by the presentation, the cruise participation certificate issued to science team.
- @ 18:30 hrs. Get together party with science team, ship officers and crews in officers mess rooms and cake cutting celebration.

Day-11, 13-April-2018

- @ 07:30 hrs. Vessel reached Chennai outer anchorage and standby for pilot.
- @ 08:30 hrs. Vessel got berthed successfully and port alongside in SQ1
- @ 12:30 hrs. Students from university of hyderabad got signed off.
- @ 17:30 hrs. Rest science team got signed off and left main deck.
- That's it we successfully completed the voyage and mission accomplished.



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