

Ocean Mixing and Monsoon (OMM) – Direct Covariance Flux System (DCFS) data processing training

The **eddy covariance** (EC) technique is a key atmospheric measurement technique to calculate vertical turbulent fluxes within atmospheric boundary layers. The method analyzes high-frequency wind and scalar atmospheric timeseries data and yields flux values of these properties. This method is used to estimate momentum, heat, water vapor, carbon dioxide, and methane fluxes. INCOIS installed a Direct Covariance Flux System (DCFS) in the flux mooring deployed in the northern Bay of Bengal in ddmmyy. The whole mooring system worked for 16 months and was recovered in ddmmyy. After the buoy recovery, the high frequency (20Hz) eddy covariance data was downloaded and processed. Dr. James Edson from Woods Hole Oceanographic Institution (WHOI) provided two training sessions to teach INCOIS scientists the data processing and quality checks of eddy covariance data.

a) The first training session – offline mode

Dr. Edson provided the first DCFS data processing at INCOIS during 9-12 December 2019. There were nine participants from INCOIS and one from the National Institute of Oceanography (NIO, Goa). The main contents of the training sessions are provided below.

1. Introduction to air-sea exchange I - Momentum Exchange
 - A. Flux parameterizations
 - B. Wave modulation
 - C. Hands-on work with COARE bulk algorithm
2. Introduction to air-sea exchange II - Energy and Heat Exchange
 - A. Sensible and latent heat exchange
 - B. Hands-on work with INCOIS data and surface heat budget
3. DCFS
 - A. Sensors, platforms and methodology
 - B. Results from INCOIS buoy
4. Hands-on work with SPURS data set I
 - A. DC Momentum Flux
 - B. DC Sensible and latent heat flux
5. Other topics (s) of interest

List of Participants

Sl No	Name	Institution
1	Shri. Pattabhi Rama Rao	INCOIS
2.	Dr. Girishkumar	INCOIS
3	Dr. B. Praveen Kumar	INCOIS
4	Dr. JVS Raju	INCOIS
5	Mr. Sureshkumar	INCOIS
6	Mr. Shivaprasad	INCOIS

7	Mr. Suprit Kumar	INCOIS
8	Mr. Abhijith Raj	INCOIS
9	Ms. Joffia Joseph	INCOIS
10	Mr. K. Vijayakumar	NIO

b) The second training session – online mode

The second training session by Dr. James Edson was conducted on the 9th, 16th, and 23rd of September 2021. This session was done online due to Covid19 pandemic-related travel restrictions. The major focus of this training session was the analysis of the processed DCFS data. There were nine INCOIS scientists and four participants from other institutions in this training session.

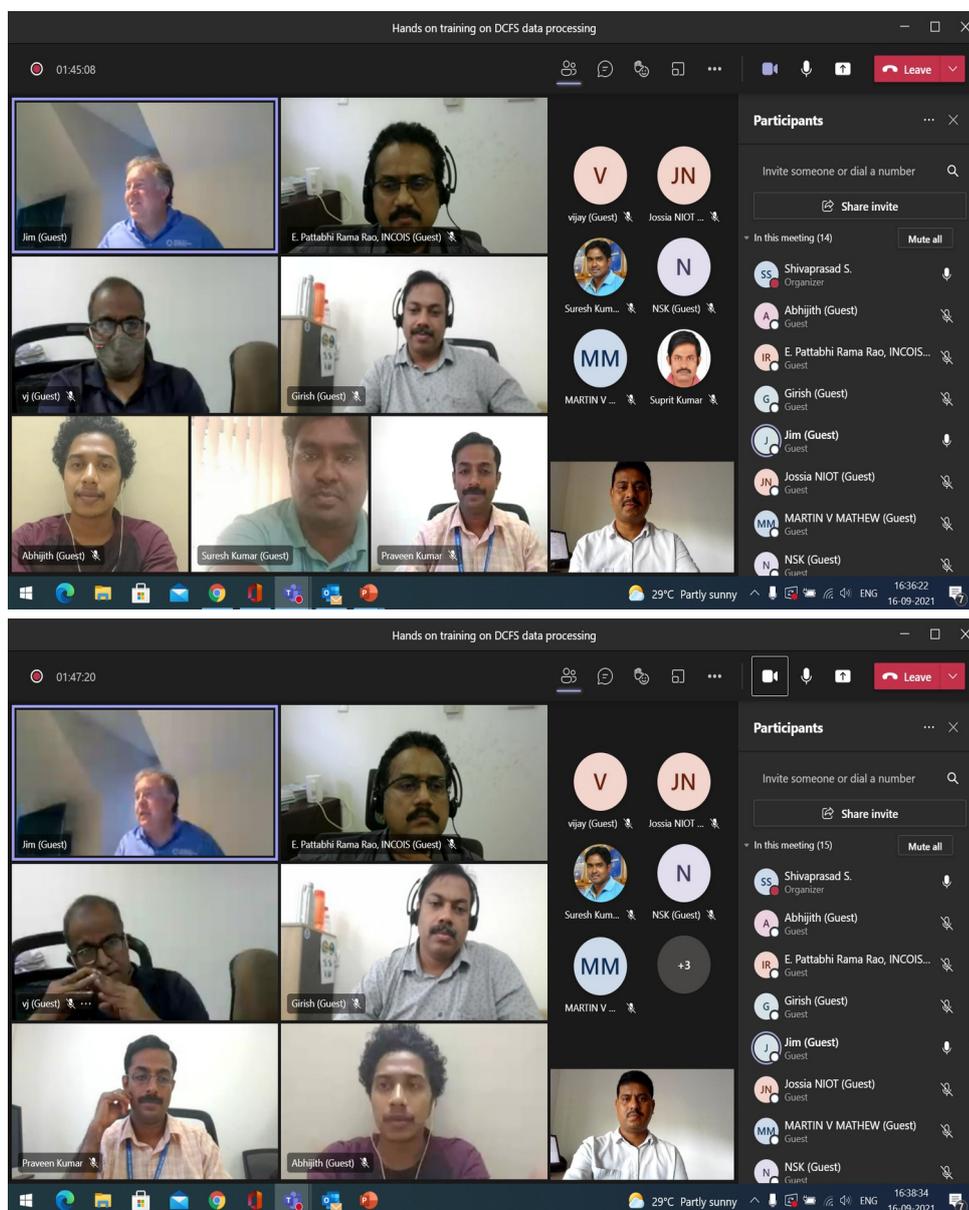


Figure: Screenshots from the second DCFS data processing training session.

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3	Dr. B. Praveen Kumar	INCOIS
4	Dr. JVS Raju	INCOIS
5	Mr. Sureshkumar	INCOIS
6	Mr. Shivaprasad	INCOIS
7	Ms. Kameswari	INCOIS
8	Mr. Suprit Kumar	INCOIS
9	Mr. Abhijith Raj	INCOIS
10	Ms. Joffia Joseph	INCOIS
11	Mr. K. Vijayakumar	NIO
12	Mr. Maheswar Pradhan	IITM
13	Dr. Jossia Joseph	NIOT
14	Mr. Martin Mathew	NIOT