

Role of Ocean in Naval Operations

World Water Day, 22 March 2022 (1730 hrs)

by

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Forum for River and Ocean Scientists and Technologists Odisha

Role of Ocean in Naval Operations - Introduction

1. How is Ocean Important for us?
2. Ocean Variabilities (Long-term and Short-term)
3. Oceanography (Descriptive and Dynamical)
4. Ocean Acoustics and Underwater Detection (SONAR)
5. ASW Oceanography (Prediction System)
6. Ocean Database
7. Ocean Observations
8. Remote Sensing

Role of Ocean/Oceanography in Naval Operations/Defence

(ASW Oceanography) - **Unclassified**

Requirements of Naval Defence:

1. Planning of Operations
2. Routine Exercises / Operations (ASW)
3. Wartime Preparedness (Naval Warfare)
4. Coastal / Open Ocean Surveillance
5. Tactical Warfare
6. Littoral Warfare etc.

Ocean Environmental Parameters

(ASW Oceanography)

1. Atmospheric Parameters
2. Ocean Surface Parameters
3. Medium Parameters
4. Ocean Bottom Parameters

Important Ocean Environmental Parameters

1. Bathymetry
2. Temperature and Salinity
3. Sea-state (Waves, White Caps and Surf)
4. Tide
5. Currents
6. Internal Waves
7. Eddies and Fronts
8. Shipping and Fishing Traffic
9. Biological Data
10. Sediment layers and their geo-acoustic properties etc.

Ocean Acoustics and Predictions for ASW Operations

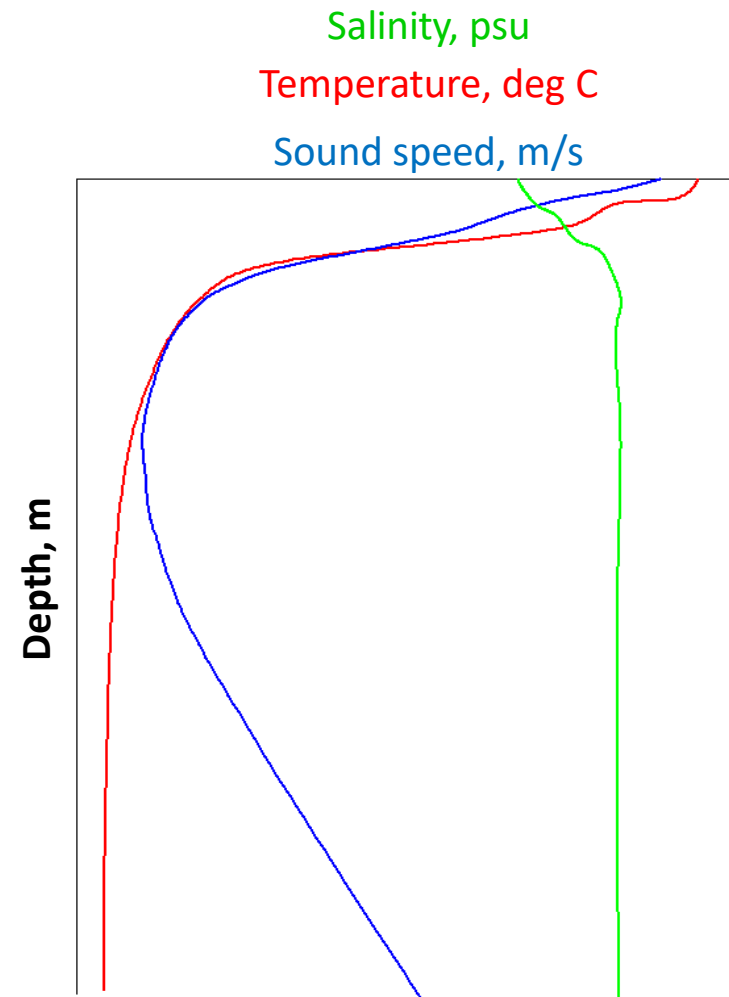
1. Propagation Modelling – 2D, 3D (SRP)
2. Ambient Noise Modelling
3. Reverberation Modelling
4. SONAR performance Modelling
5. Tactical Warfare Modelling
6. Littoral Warfare Modelling etc.

(Operational Ocean & Acoustic Prediction System)

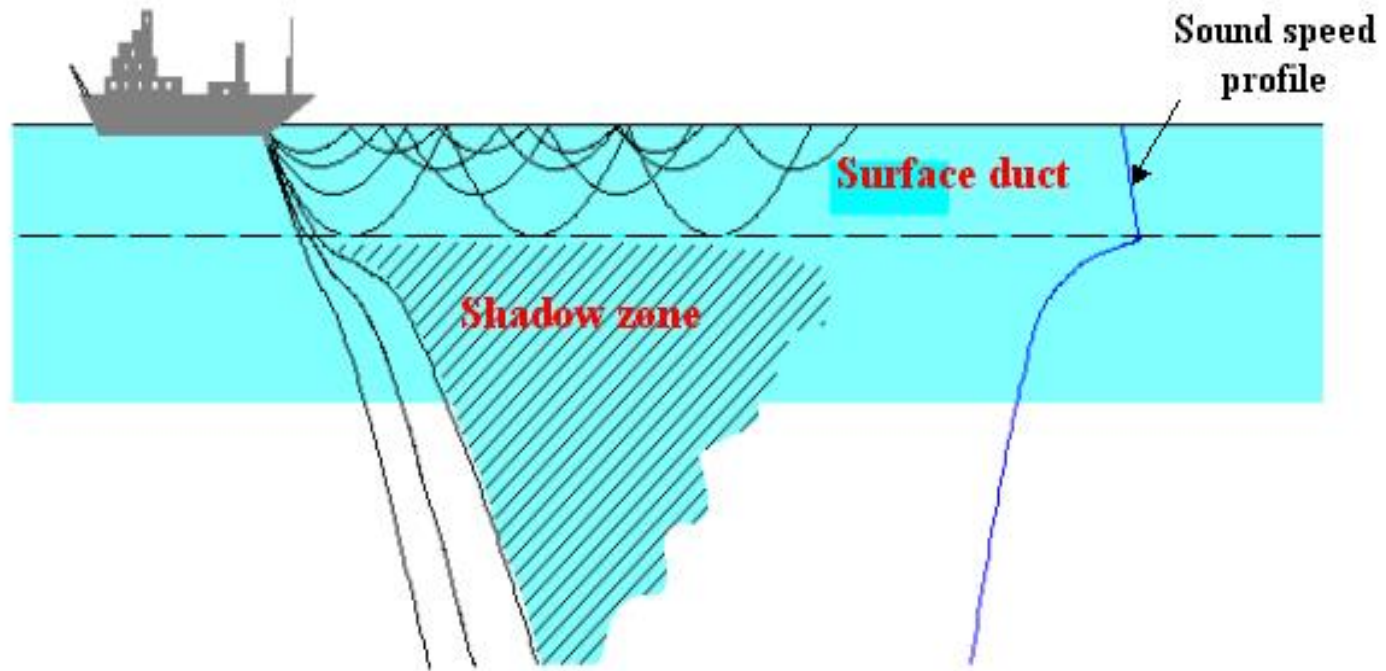
Ocean Environmental Predictions for ASW Operations

1. Wave Modelling
2. Tide Modelling
3. Circulation Modelling
4. Internal Wave Modelling
5. Geo-Acoustic Modelling
6. Littoral Zone/Ocean Modelling
(Coastal & Near-shore/Littoral Waters)

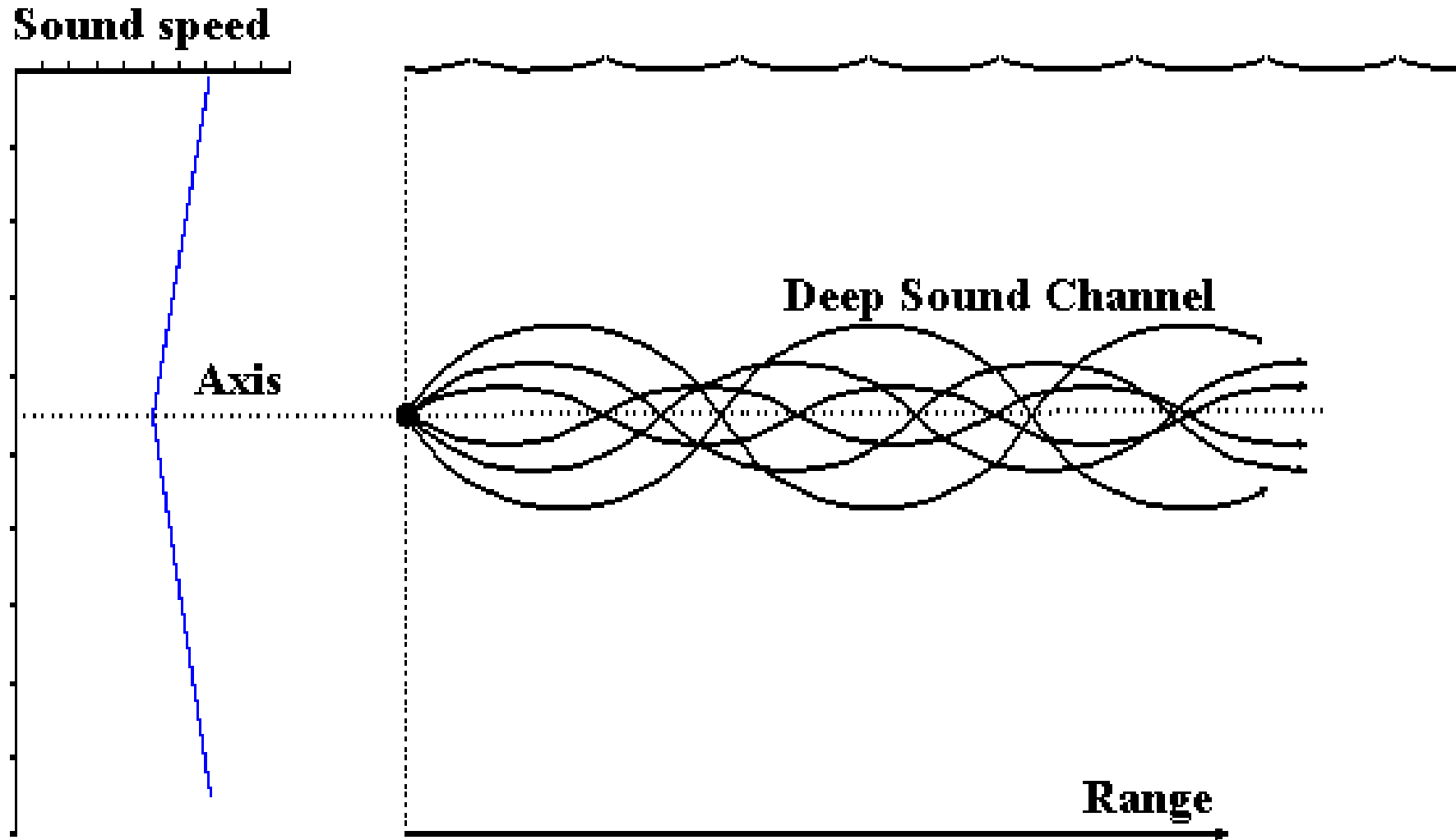
Profiles of Temperature, Salinity, and Sound Speed



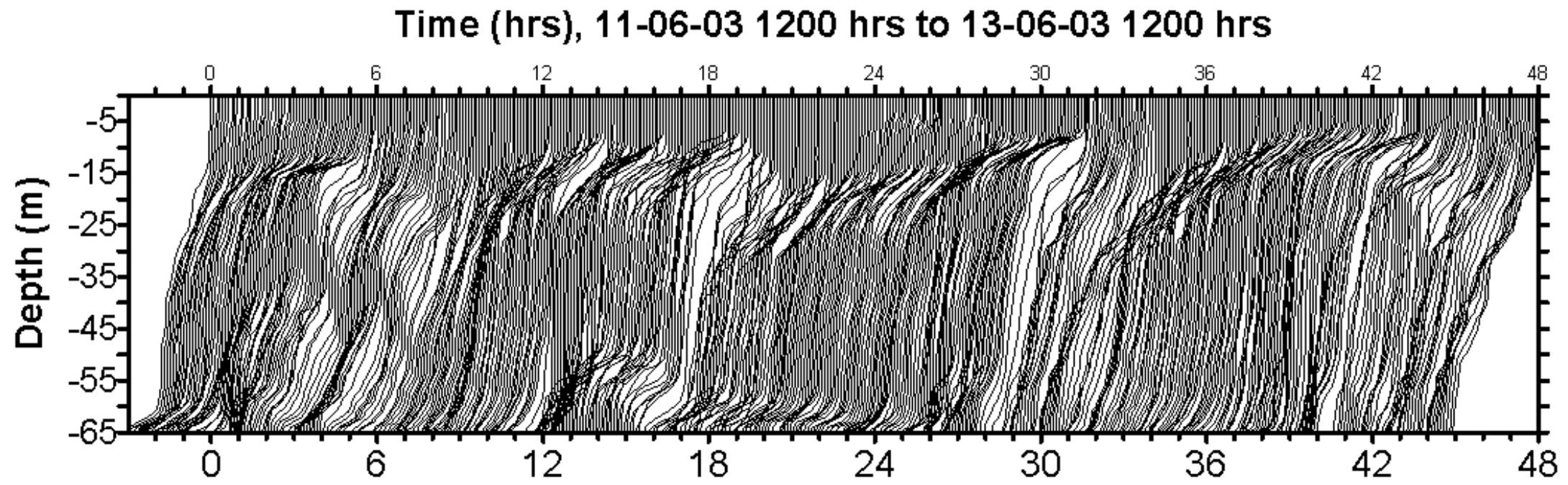
Surface Duct



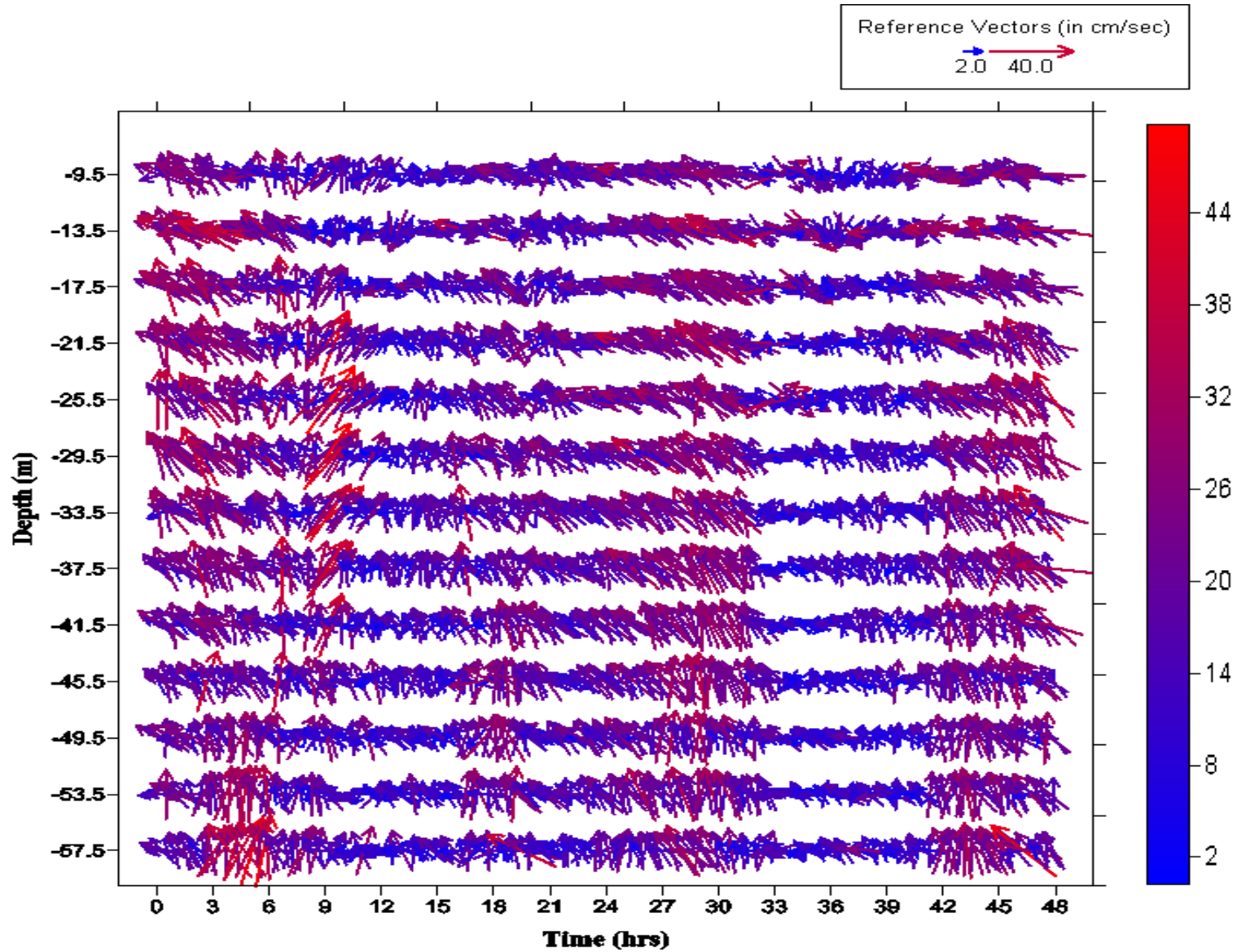
SOFAR Channel



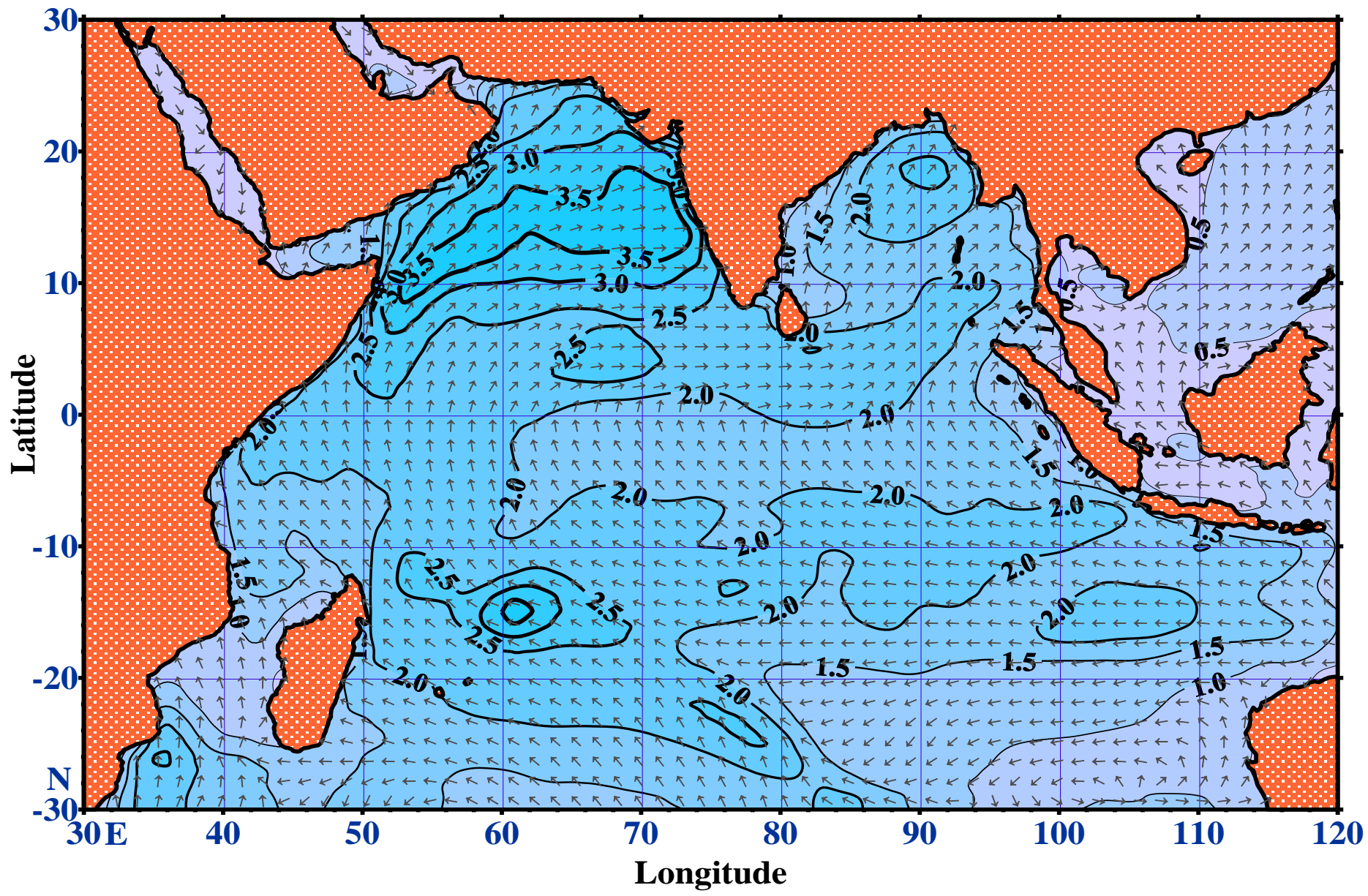
CTD Time-series – at 6 minutes intervals, Off Cochin



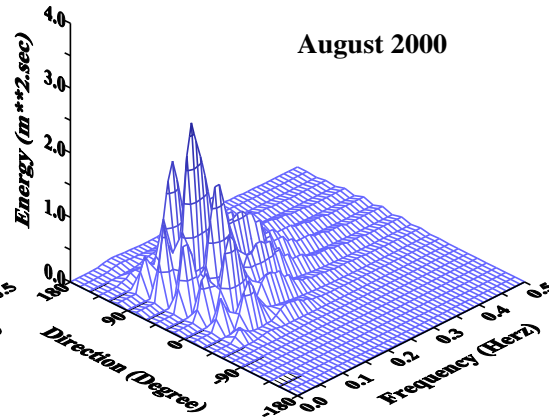
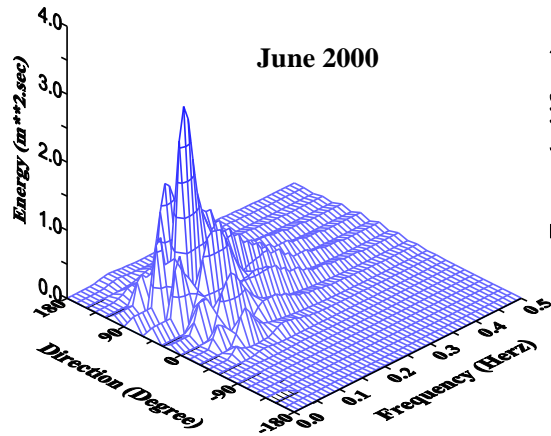
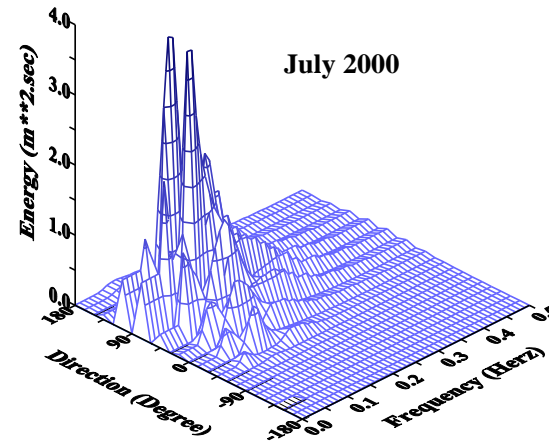
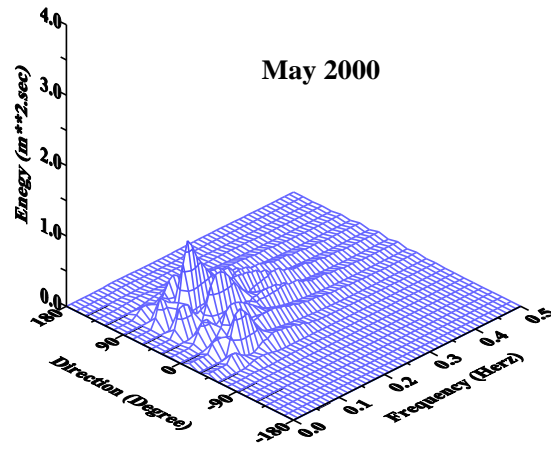
ADCP – Time Series Currents



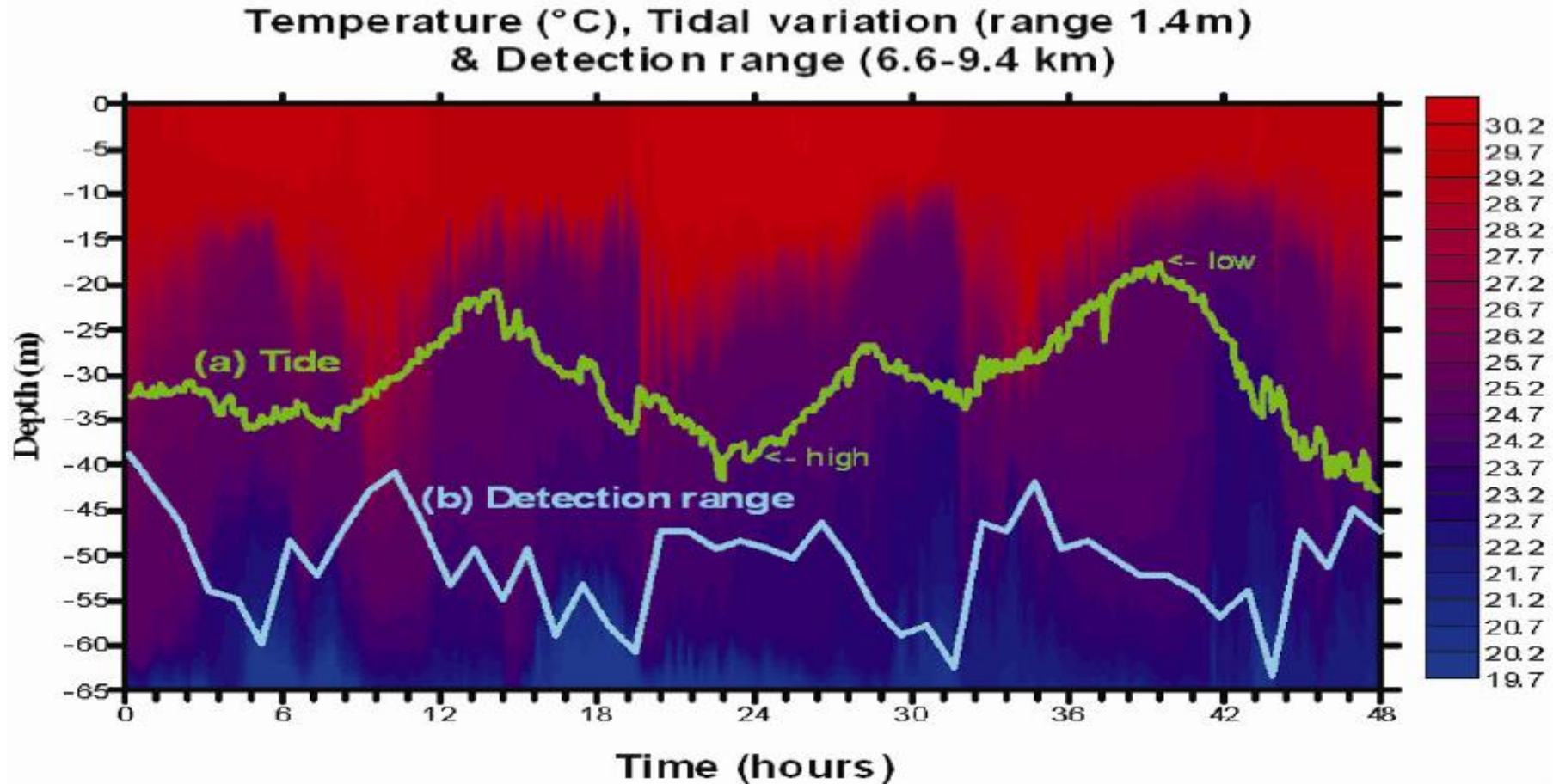
Predicted Wave Field



Predicted Wave Spectra



Predicted SONAR Range (Short-Term Variability)



Thanks