Ocean Microstructure Glider (OMG) 2016

MicroRider Training Program

May 10 - 13, 2016

University of Las Palmas de Gran Canaria

Parque Científico Tecnológico de la ULPGC

RSI Training Course for a MicroRider Turbulence Measurement Instrument mounted on to a Slocum glider manufactured by Teledyne Webb Research. This training course is intended to span three to three and a half days, with half to one day of this time dedicated to field measurements.

Course Outline

Day 1 will focus on the fundamentals of MicroRider usage. The material will be geared towards both technical and scientific personnel. Units covered will include

- Unit One: Introduction to the MicroRider
- Unit Two: Data Acquisition Software (ODAS5IR)
- Unit Three: Pre-deployment Checks

Day 2 is the field test; all course participants must attend. The cruise length varies depending on location, weather conditions, and glider user expertise. If time allows, MicroRider maintenance (Unit Five) will be performed after the cruise; otherwise it is covered on Day 3.

- Unit Four: Glider deployment
- Unit Five: MicroRider Maintenance (optional)

Day 3 will cover the technical aspects of data acquisition and processing. The material is geared towards the scientific user.

- Unit Five: MicroRider Maintenance
- Unit Six: Data Conversion and Processing
- Unit Seven: Signal Conditioning

Day 4 is an optional morning special topics workshop on applications, operations and research featuring the OMG.

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Learning Goals

Unit One: Introduction to the MicroRider
- Locate and identify sensors, probes, and axes of orientation
- Safely disassemble and assemble the MicroRider
- Differentiate between a piston seal and a face seal
- Locate and identify the boards and understand their function
- Describe the flow of information and analog signal processing that occurs in the MicroRider
- Install and remove probes
- Confirm proper orientation of the shear probes

Unit Two: Data Acquisition Software (ODAS5IR)
- Connect the MicroRider to a computer
- Power on the MicroRider
- Establish serial console connection between the computer and the MicroRider
- Describe the file structure of the data logger
- Run the 'calibrate all' function and interpret the results
- Setup RSILink for data file transfer
- Transfer files to and from the data logger using a USB connection
- Interpret and edit a configuration file (setup.cfg)
- Differentiate between the [root], [matrix], [vehicle_info], and [channel] sections of the configuration file
- Identify which calibration parameters are board-specific and which ones are probe-specific
- Describe the data file format
- Interpret the log file.

Unit Three: Pre-deployment Checks
- Perform a bench test with dummy probes; process and interpret the data
- Identify every sealing surface on the instrument and confirm their integrity.

Unit Four: Glider deployment
- Perform pre-deployment checks (Unit Three) at sea
- Deploy and recover glider equipped with MicroRider
- Identify successful data recording and interpret log file.
- Identify data contamination from mechanical sources

Unit Five: MicroRider Maintenance
- Disassemble the MicroRider into its components
- Determine if an O-ring needs to be replaced
- Recognize corrosion and moisture damage
- Perform routine post-cruise and annual maintenance
- Reassemble the MR and all of its components

Unit Six: Data Conversion and Processing
- Extract, edit, and patch a configuration file string into existing data file
- Convert .p data file into physical units and save as .mat file
- Extract "profiles" from a data file
- Assess kinematic quality of profiles and deployment
- Identify mechanical contamination of data files
- Perform *in situ* calibration of temperature probes, if applicable
- Identify turbulent regions from shear, temperature, and conductivity traces
- Modify key parameters in data processing including, but not limited to: fft length, overlap, and dissipation length
- Calculate shear spectra
- Calculate rate of TKE dissipation

Unit Seven: Signal Conditioning
- Distinguish between a channel with and without pre-emphasis
- Describe the concept of pre-emphasis
- Adjust key parameters of the despiking routine
- Discuss the Goodman coherent noise removal technique