Ocean Microstructure Glider (OMG) 2016
MicroRider Training Program

May 10 - 13, 2016

Parque Científico Tecnológico de la ULPGC

E35214 -TALIARTE (TELDE) Gran Canaria

A Training Course for a Rockland MicroRider Turbulence Measurement Instrument mounted on the Teledyne Webb Research Slocum Glider. This training course is intended to span three to three and a half days, with one day dedicated to field measurements. OMG 2016 will be facilitated by instrument specialists from Rockland Scientific and a glider pilot instructor from Teledyne Webb Research.

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 covers the technical aspects of data processing and analysis. 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.

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 and confirm proper orientation

Unit Two: Data Acquisition Software (ODAS5IR)
- 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 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.
- Slocum glider functional checkout procedure
- Verify MicroRider sensor operation and OMG mission & sampling plan

Unit Four: Glider Deployment
- Perform pre-deployment checks of Slocum and MicroRider (Unit Three) at sea including ballast check
- Deploy Slocum Glider equipped with MicroRider
- Perform dives for MicroRider dataset acquisition
- Perform real-time review of glider deployment information
- Recover Slocum Glider equipped with MicroRider
- Identify successful data recording and interpret log file
- Identify data contamination from mechanical sources
- Perform post-recovery Slocum Glider maintenance

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