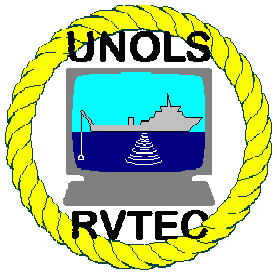
INMARTECH 2006

International Marine Technicians Symposium

October 17 - 19, 2006

Program Agenda

Woods Hole Oceanographic Institution
Woods Hole, Massachusetts USA



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International Marine Technician Symposium 2006

INMARTECH 2006 – At a Glance

Technical Sessions, Locations, and Times

The INMARTECH Symposium will be held in Woods Hole Village. The Sessions will be located in either the Lillie Auditorium (located in the Lillie Building at MBL - the entrance is off of MBL Street) or the Redfield Auditorium (located in the Redfield Building at Woods Hole Oceanographic Institution on Water Street).

Time	Session Number	Session Title	Location (Auditorium)
Day 1: Tuesday, October 17, 2006			
0730		Registration and Symposium Check-In	Lillie
0830		INMARTECH 2006 Welcome and Plenary Session	Lillie
0900	I	Ships, Shipboard Handling Systems, and Over-the-Side Safety Issues	Lillie
1200		Lunch	Lillie
1300	II a	Innovations in Vehicle Systems	Redfield
	II b	Equipment and Procedure Innovations	Lillie
1620		Day 1 Wrap-Up Session	Redfield
1730	Facility Tours (Ships, vehicles, and equipment), Poster Session, and Evening Reception		
Day 2: Wednesday, October 18, 2006			
0830		Day 2 Plenary Session	Lillie
0845	III a	Underway Data Collection and Archiving Standards	Lillie
	III b	Long-term Instrumentation Deployments - Challenges, Issues, and Solutions	Redfield
1200		Lunch	Redfield
1300	IV	Lessons Learned - Equipment Tricks, Techniques, and Cool Products	Redfield
1645		Day 2 Wrap-Up Session	Redfield
Day 3: Thursday, October 19, 2006			
0830		Day 3 - Plenary Session	Redfield
0845	V a	International Shipping - Dealing with New Regulations (Chemicals, Samples, Instrumentation)	Redfield
	V b	Ship to Ship/Ship to Shore Wireless Access Protocol (SWAP)	Redfield, Room 204
1030	VI	Session VI: Shipboard Networks and Network Security	Redfield
1145		Session V and VI Wrap-Up	Redfield
1215		INMARTECH 2006 - Closing Remarks	Redfield

International Marine Technician Symposium 2006 (INMARTECH 2006) Technical Session Program

The INMARTECH Symposium will be held in Woods Hole Village. The Sessions will be located in either the Lillie Auditorium (located in the Lillie Building at MBL - the entrance is off of MBL Street) or the Redfield Auditorium (located in the Redfield Building at Woods Hole Oceanographic Institution on Water Street). Each session location is identified below.

Day 1: Tuesday, October 17, 2006

0730 Registration and Symposium Check-In (Lillie Auditorium) - Coffee and Danish

0830 INMARTECH 2006 Welcome and Plenary Session (Lillie Auditorium)

- Welcome address from Woods Hole Oceanographic Institution (WHOI) – Dr. Robert Detrick, Vice President for Marine Facilities & Operations
- Opening remarks about INMARTECH 2006 – Barrie Walden (WHOI)

0900 Session I: Ships, Shipboard Handling Systems, and Over-the-Side Safety Issues (Lillie Auditorium) – Moderators: Bill Martin (University of Washington) and Matthew Hawkins (University of Delaware)

0900 Wire Testing – Rick Trask (WHOI)

0920 Survey on Wire Maintenance and Testing –David Fisichella (WHOI)

0940 Shipboard Handling Systems - Matthew Hawkins (University of Delaware)

1000 Dynamic and Drag Induced Loads on Marine Cranes – Steve Etchemendy (Monterey Bay Aquarium Research Institute)

1020 Break

1040 RRS *James Cook* - A Multi-Role Oceanographic Research Vessel Entering Service in 2007 – Ed Cooper (NERC – National Oceanography Centre, Southampton)

1100 R/V *Pourquoi pas* ? A New Multidisciplinary Vessel for Ocean Research – Olivier Lefort and Marc Nokin (Ifremer)

1120 Recent Developments on RRS *James Clark Ross* "Challenges of a Refit" – Steve Bremner (British Antarctic Survey)

***1200 Lunch Break* (Lillie Auditorium)**

Session II will consist of two concurrent sessions.

1300 Session IIa: Innovations in Vehicle Systems (Redfield Auditorium) – Moderators: Stewart Lamerdin (MLML) and Steve Etchemende (MBARI)

Autonomous Underwater Vehicle (AUV) Operations:

1300 Monterey Bay Aquarium Research Institute (MBARI) AUV Operations – Steve Etchemendy (MBARI)

1320 The *ABE* and *Sentry* Autonomous Underwater Vehicles – Dana R. Yoerger (WHOI)

Towed Vehicles:

1340 Video Plankton Recorder: A Systems And Operational Overview – Josh Eaton (WHOI)

1400 High Definition TV on *Hyper Dolphin* –Tomoe Kondo (Nippon Marine Enterprises, ltd.)

1420 Break

1440 First Year of *Kaiko 7000* –Atsumori Miura (Nippon Marine Enterprises, ltd.)

1500 Towed Ocean Bottom Instrument (TOBI) - Upgrades for the 21st Century – Duncan Matthew (National Oceanographic Centre, Southampton)

1520 Hybrid Underwater Vehicle for Full Ocean Depth Exploration - Andy Bowen (WHOI)

1540 Gliders/Argo – Breck Owen (WHOI)

1300 Session IIb: Equipment and Procedure Innovations (Lillie Auditorium) – Moderators: James Broda (WHOI) and Ed Cooper (NERC)

1300 WHOI Long Core Development: Update – James Broda (WHOI)

1320 *Pourquoi pas ?* Winches and Coring System – Loic Dussud (Ifremer)

1340 Shipboard ADCP Systems and Heading Sensors: Status Report – Julia Hummon (University of Hawaii)

1400 Multibeam (backscatter) – Luciano Fonseca (UNH)

1420 Break

1440 Pressure Retaining Deep-sea Sampler – Marck Smit (Netherlands Institute for Sea Research (NIOZ))

1500 A New Ultra Clean CTD-System for Sampling of Trace Elements and Isotopes – Sven Ober (NIOZ)

1520 Improvement of Air-gun System for Multi-channel Seismic Survey – Hidenori Shibata (Nippon Marine Enterprises, ltd.)

1540 Upgrade of the RRS *James Clark Ross* Propulsion Control System – Richard Bridgeman (British Antarctic Survey)

1620 Day 1 Wrap-Up Session (Redfield Auditorium) – Summary of Day 1 Sessions:

- Session I Summary: Ships, Shipboard Handling Systems and Over-the-Side Safety Issues – Bill Martin (University of Washington) and Matthew Hawkins (University of Delaware)
- Session IIa Summary: Innovations in Vehicle Systems – Stewart Lamerdin (MLML) and Steve Etchemende (MBARI)

- Session IIb Summary: Equipment and Procedure Innovations – James Broda (WHOI) and Ed Cooper (NERC)

1730 Facility Tours (Ships, vehicles, and equipment), Poster Session, and Evening Reception

- Facility Tours–R/V *Oceanus* - Patrick Rowe and John Dyke (WHOI)
- Facility Tours–CRV *Tioga* – Ken Houtler (WHOI)
- Facility Tours - AUV *Sentry*, Video Plankton Recorder, Hydrographic Van - Barrie Walden (WHOI)
- Facility Tours – Isotope Van – Matthew Hawkins (U. Delaware)
- The NOAA Portable Seagoing Air-Sea Flux Standard - Chris Fairall (National Oceanographic and Atmospheric Administration)
- Poster: Useful Techniques for Bottle Salinity Measurements - -Naoko Takahashi (Marine Works Japan LTD.)
- Poster: Temperature Error Caused by Attitude Motion of Sea-Bird 9plus CTD – Satoshi Ozawa (Marine Works Japan LTD.)
- Poster: Technical Services of Marine Works Japan Ltd. - Testuharu Iino (Marine Works Japan Ltd.)
- Poster: The Acoustic Navigation Of Deep-Towed Underwater Imaging Vehicles Using A Reversed Ultra Short Base - Duncan Matthew (National Oceanography Centre, Southampton)
- Poster: Alaska Region Research Vessel – Steven Hartz (University of Alaska)
- Poster: Sea Education Association oceanographic training vessels as Ships of Opportunity - Erik Zettler (Sea Education Association)
- Poster: The Technology Improvement of Radiosonde Observation and Evaluation Character of the Humidity Sensor - Ryo Oyama (Global Ocean Development Inc.)

Day 2: Wednesday, October 18, 2006

0830 Day 2 Plenary Session (Lillie Auditorium) – Barrie Walden

Session III will consist of two concurrent sessions.

0845 Session IIIa: Underway Data Collection and Archiving Standards (Lillie Auditorium) – Moderators: Dennis Shields (NOAA) and Rich Findley (University of Miami)

0845 Quality Improvement and Control System (QuIC System) – Ilya Nikanorov (University of Miami)

0905 The Frame-Grabber System for Integrated Content and Data Access – Steven Lerner (WHOI)

0925 The SAMOS Data Assembly Center – Shawn Smith (Florida State University)

0945 LabView – Rich Findley (University of Miami)

1005 WHOI's Underway Data Collection System – Barrie Walden (WHOI)

1025 Break

1045 SW06 Data Handling – Andrew Maffei (WHOI)

1105 Roles of Nippon Marine Enterprises, Ltd. Marine Technicians in Research Submersible Cruises – Okada Satoshi (Nippon Marine Enterprises, Ltd.)

1120 National Oceanic and Atmospheric Administration's SCS – Dennis Shields (NOAA)

1140 Two Data Management Tools for Oceanographic Research – Val Schmidt (University of New Hampshire)

0845 Session IIIb: Long-term Instrumentation Deployments - Challenges, Issues, and Solutions (Redfield Auditorium) – Moderators – Mary-Lynn Dickson (URI) and Erik Zettler (SEA)

0845 Shallow Water "06" 62 Moorings in 6 Days – John Kemp (WHOI)

0915 The ORION Global Scale Observatory- An Array of Open Ocean Moorings for Interactive Ocean Observation – Dan Frye (WHOI)

0945 Monterey Accelerated Research System,(MARS) a Test Bed Cabled Observatory – Steve Etchemendy (MBARI)

1015 Break

1045 Ocean Bottom Seismometry at Woods Hole Oceanographic Institution-Toward a Permanent Presence – Beecher Wooding (WHOI)

1055 Fast Thermistor String Model 3 – Edwin Keijzer (NIOZ)

1200 Lunch (Redfield Auditorium)

1300 Session IV: Lessons Learned - Equipment Tricks, Techniques, and Cool Products (Redfield Auditorium) – Moderators: Patrick Rowe (??) and Tom Wilson (SUNY)

1300 Metal-Free Instrumented Block and Light Weight .322 Wire Block – Barrie Walden (WHOI)

1315 Field Repairable Slip rings – Barrie Walden (WHOI)

1330 Far-End Cable Tension Monitor – Barrie Walden (WHOI)

1345 Hot Glue... And you thought it was just for arts and crafts! – Patrick Rowe (WHOI)

1400 Seafloor Search with Remote Sensing – Paul Matthias (Raytheon)

1415 Securing Fish Exclusion Cages on the Sea Bed by Scuba Divers – Andre Cattrijsse and Francisco Hernandez (Flanders Marine Institute)

1430 Break

1445 Improved Mooring Cable Stopper – Jack Schilling (Netherlands Institute for Sea Research (NIOZ))

1500 New Water Sampler Valve: High Opening Ratio and Inert Material – Edwin Keijzer (NIOZ)

1515 Hull Penetrating Instrumentation - Platform for Ferries – Lorendz Boom (NIOZ)

1530 Sea Surface Temperature Monitoring – David Fisichella (WHOI)

1545 *Kilo Moana*'s Real-time Shipboard Multibeam Bathymetry and Backscatter Mosaic Display System – Bruce Appelgate and Roger Davis (University of Hawaii)

1600 Guide To Making Climate Quality Meteorological And Flux Measurements At Sea – Shawn Smith (Florida State University)

1615 Three Solutions found for Irish Research Vessels– Bill Dwyer (P&O Maritime Services Ireland Ltd)

1630 Debubbler – Tom Wilson (State University New York)

1645 Day 2 Wrap-Up Session (Redfield Auditorium) – Summary of Day 2 Sessions

- Session IIIa: Underway Data Collection and Archiving Standards – Dennis Shields (NOAA) and Rich Findley (University of Miami)
- Session IIIb: Long-term Instrumentation Deployments - Challenges, Issues, and Solutions – Mary-Lynn Dickson (URI) and Erik Zettler (SEA)
- Session IV: Lessons Learned - Equipment Tricks, Techniques, and Cool Products – Patrick Rowe (WHOI) and Tom Wilson (SUNY)

Day 3: Thursday, October 19, 2006

0830 Day 3 - Plenary Session (Redfield Auditorium) – Barrie Walden (WHOI)

Session V will consist of two concurrent sessions.

0845 Session V.a: International Shipping - Dealing with New Regulations (Chemicals, Samples, Instrumentation) (Redfield Auditorium) – Moderators: Rick Chandler (WHOI)

- International Shipping: Dealing with New Regulations – Stephen Senior (WHOI)

0845 Session V.b: Ship to Ship/Ship to Shore Wireless Access Protocol (SWAP) – **(Redfield Building, Room 204)** - Moderators: Toby Martin (Oregon State University), Val Schmidt (UNH), and Jim Akens (WHOI)

- Equipment Requirements – Toby Martin (OSU)
- Software and Operations – Val Schmidt (UNH)
- Multi-ship Experiences - Lessons Learned –

1015 Break

1030 Session VI: Shipboard Networks and Network Security (Redfield Auditorium) – Moderators: Rich Findley (U. Miami) and Barrie Walden (WHOI)

- HiSeasNet: Bringing the Internet to the High Seas for 4 Years and Counting – Steve Foley (SIO)
- The R/V *Pelican*'s Experiences with the HiSeasNet Small-footprint Ku-band System – Brenda Leroux Babin (LUMCON)
- Research Vessel Network Management and Computer Security:
    - *Wecoma* – Toby Martin (Oregon State University)
    - R/V *Thomas G Thompson* – Bill Martin (University of Washington)
    - WHOI – Jim Akens (WHOI)
    - HBOI/U.Miami – Rich Findley (U. Miami)
    - Scripps Institution of Oceanography – Jon Meyer and Kris Weeks (SIO)
    - Ocean Drill Ship - Andrew Trefethen (Texas A&M IODP)
- International Experiences – Dougal Mountifield (National Oceanographic Center, Southampton) and David Blake (British Antarctic Survey)

1145 Session V and VI Wrap-Up – Summary of Session discussions (Redfield Auditorium):

- Session V.a Summary: International Shipping - Dealing with New Regulations (Chemicals, Samples, Instrumentation) –Rick Chandler (WHOI)
- Session V.b: Ship to Ship/Ship to Shore Wireless Access Protocol (SWAP) – Toby Martin (Oregon State University) and Val Schmidt (UNH)
- Session VI Summary: Shipboard Network Security – Rich Findley (U. Miami) and Barrie Walden (WHOI)

1215 INMARTECH 2006 - Closing Remarks (Redfield Auditorium) – Barrie Walden (WHOI)

1230 Adjourn

Abstracts (Listed by Presenter in Alphabetical Order)

Appelgate, Bruce and Davis, Roger (University of Hawaii)
TITLE: Kilo Moana's real-time shipboard multibeam bathymetry and backscatter mosaic display system
ABSTRACT: The Hawaii Mapping Research Group (HMRG) of the University of Hawaii has developed a bathymetry and backscatter mosaic software package that is suitable for use either in real-time survey operations or non-real-time processing applications. The system was originally developed for use with HMRG's own towed sonar systems but is also compatible with shipboard multibeam systems. It has been operational on R/V Kilo Moana under the supervision of the University's Ocean Technology Group marine science technicians for well over a year in support of that vessel's Kongsberg/Simrad EM120 and EM1002 multibeams.

Babin, Brenda Leroux (LUMCON)
TITLE: The R/V *Pelican*'s Experiences with the HiSeasNet Small-footprint Ku-band System
ABSTRACT: Just as the R/V *Pelican* was preparing to leave the dock for Puerco Rico, the ship went online with HiSeasNet. Utilizing a SeaTel 4006 1, Ku-band antenna, the R/V *Pelican* now has an always on connection to LUMCON's network. This system was invaluable to the crew in Puerto Rico as they watched the progression of several hurricanes and tropical storms moving through the Atlantic. This presentation will focus on the trials and successes we've had getting this system up and running.

Boom, Lorendz (Netherlands Institute for Sea Research)
TITLE: Hull Penetrating Instrumentation - Platform for Ferries
ABSTRACT: A presentation about the 'hull penetrating instrumentation-platform' we are using on the ferrie between the island Texel and the mainland for long-term measurements concerning: current, temperature, salinity, changes in depth, transport of particles and the algae-activity of the water going in and out the 'Waddensea' with the tide.

Bowen, Andy D (Woods Hole Oceanographic Institution)
TITLE: Hybrid Underwater Vehicle for Full Ocean Depth Exploration
ABSTRACT: The Hybrid Remotely Operated Vehicle (HROV), being designed and built by Woods Hole Oceanographic Institution (WHOI) with the support of the Space and Naval Warfare Systems Center San Diego (SSC San Diego), will provide a new level of accessibility for deep ocean research. HROV will be primarily an autonomous vehicle but will be reconfigurable to a teleoperated system by the installation of a fiber optic data link and a manipulator based work system.

Bremner, Steve (British Antarctic Survey)
TITLE: Recent Developments on RRS *James Clark Ross* "Challenges of a Refit"
ABSTRACT: Increasing the capability of the vessel to extend its life and value to the community is often demanding. The recent installation of an Ultra Short Base Line System (USBL) and the modifications to enable the ship to deploy and operate the *ISIS* ROV have presented many challenges.

Bridgeman, Richard P (British Antarctic Survey)
TITLE: Upgrade of the RRS James Clark Ross Propulsion Control System
ABSTRACT: This presentation outlines the technology to be used to replace the ships electric drive control system and power management system installed at launch in 1991.

Broda, James E. (Woods Hole Oceanographic Institution)
TITLE: WHOI Long Core Development: Update
ABSTRACT: An overview of the status of the WHOI Long Core Program will be presented. Ship modifications, handling equipment details, and the ODIM fiber rope traction system [CTCU] will be reviewed.

Cattrijsse, Andre and Francisco, Hernandez (Flanders Marine Institute)
TITLE: Securing Fish Exclusion Cages On The Seabed
ABSTRACT: For the purpose of biological experiments cages needed to be set in the vicinity of a shipwreck. We present how we dealt with the problem of choosing, placing and securing the cages at 20m depth in a turbid and high current environment. The presentation communicates about the problems faced, and solutions found and to aims at receiving inputs for improvements.

Cooper, Edward (National Oceanography Centre, Southampton)
TITLE: RRS *James Cook* - A Multi-Role Oceanographic Research Vessel Entering Service in 2007
ABSTRACT: The Natural Environment Research Council (NERC), took delivery of the newly built multi-role research vessel RRS James Cook at the end of August 2006 from the Norwegian shipbuilder Flekkefjord Slipp & Maskinfabrikk AS.

At 91m length, 18.6m breadth and a draft of 5.5m the James Cook represents the introduction of a major facility to the UK Marine Science Community. The vessel as delivered includes the major scientific tools expected of such a vessel, for example a suite of deep ocean winches, over-side handling capability through gantries and cranes, multibeam echosounders, communications and networking. The vessel has Dynamic Positioning utilizing tunnel thrusters and a combination of twin propellers with rudders. In comparison with existing NERC vessels, the James Cook exhibits an improvement on the underwater radiated noise being ICES (Recommendation 209) compliant.

Currently the vessel is engaged on familiarization, training and commissioning exercises, which will lead in to the first science cruise in March 2007.

This talk will be used to introduce the vessel and some of her capabilities.

Davis, Roger and Appelgate, Bruce(University of Hawaii)
TITLE: Kilo Moana's real-time shipboard multibeam bathymetry and backscatter mosaic display system
ABSTRACT: Abstract can be found in full under "Appelgate."

Dwyer, Bill (P&O Maritime Services Ireland)
TITLE: Three Solutions found for Irish Research Vessels
ABSTRACT: A brief description solutions to three different problems. Firstly a simple a CTD davit design, secondly a simple method to reduce Vortice Induced Vibration and finally managing mooring chain on a small vessel.

Eaton, Joshua, A (Woods Hole Oceanographic Institution)
TITLE: Video Plankton Recorder: A Systems And Operational Overview
ABSTRACT: The Video Plankton Recorder (VPR) is becoming an important Oceanographic tool. The system provides high speed data collection and real-time data processing giving scientist effective use of ship time. The instrument provides CTD, Fluorescence, and Plankton data making it easy to map and identify features.

Etchemendy, Steve A. (Monterey Bay Aquarium Research Institute)
TITLE: Dynamic and Drag Induced Loads on Marine Cranes
ABSTRACT: Launching heavy packages at sea causes dynamic g-force loads that are often not considered in the safe working load of marine cranes. Lowering loads to the sea bottom requires drag induced loads to be considered. This talk will discuss the forces that must be considered for safe load handling.

Etchemendy, Steve A. (Monterey Bay Aquarium Research Institute)
TITLE: Monterey Bay Aquarium Research Institute (MBARI) AUV operations
ABSTRACT: MBARI Marine Operations Division, provides the services of a multibeam mapping AUV and a mid-water AUV for CTD and variable sensor packages. This talk will review the capabilities of these two AUVs, and provide samples of science data for review.

Etchemendy, Steve A. (Monterey Bay Aquarium Research Institute)
TITLE: Monterey Accelerated Research System, (MARS) a Test Bed Cabled Observatory
ABSTRACT: MARS, the Monterey Accelerated Research System, was created to economically test and evaluate technology destined for ORION observatories. This talk will review the MARS system capabilities and associated developments to enable the MARS Operations and Maintenance group to support future ORION scientists and engineers.

Fisichella, David C. (Woods Hole Oceanographic Institution)
TITLE: Survey on Wire Maintenance and Testing
ABSTRACT: Synopsis of survey results from EM wire users on wire testing, maintenance and replacement methodology for the purpose of developing test standards and objective wire evaluation criteria

Fisichella, David C. (Woods Hole Oceanographic Institution)
TITLE: Sea Surface Temperature Monitoring
ABSTRACT – Many research vessels measure sea surface parameters at a considerable distance from the sample water's entrance into the piping system. For many parameters this is not an issue but temperature can be a problem and therefore measurement probes are frequently installed in the piping system as close to the inlet as possible. Unfortunately, there are cases where this is not practical. As an alternative, WHOI is experimenting with the Seabird SBE48, which is a measurement device that magnetically attaches to the ship's hull and uses the hull temperature as an indicator of sea temperature.

Foley, Steve (Scripps Institution of Oceanography, UCSD)
TITLE: HiSeasNet: Bringing the Internet to the High Seas for 4 Years and Counting
ABSTRACT: HiSeasNet is a satellite network linking ships at sea to the their home institutions and the Internet via 3 satellites spanning the Pacific and Atlantic oceans. Using C-Band and Ku-Band technology, UNOLS research vessels enjoy full-time IP data connections for real- time data transfer to and from shore at speeds of up to 200 kbps. With 4 years of successful operation and now 10 ships online, HiSeasNet has encountered and overcome a variety of problems and continues to change the way science is done at sea.

Francisco, Hernandez and Cattrijsse, Andre (Flanders Marine Institute)
TITLE: Securing Fish Exclusion Cages On The Seabed
ABSTRACT: See listing for Cattrijsse.

Frye, Daniel E. (Woods Hole Oceanographic Institution)
TITLE: The ORION Global Scale Observatory- An Array of Open Ocean Moorings for Interactive Ocean Observation
ABSTRACT: The National Science Foundation is planning to fund the construction and operation of ocean observatories on coastal, regional, and global scales. The Global Scale Observatory will consist of an array of moored platforms located in scientifically important areas in the deep ocean. The observatory infrastructure to be funded under this plan will include surface buoys and associated power generation and communications equipment along with sensor arrays on the seabed, in the water column and at the air-sea interface. Two-way communication between the surface buoys and the shore will be accomplished with satellite telemetry links while communication between buoys and sensors will utilize fiber optic and copper conductor links as well as acoustic links. Surface buoy technology will include both single point discus buoy moorings and tri-moored spar buoys. The presentation will present the conceptual plan for the Global Scale Observatory and discuss the technology that will be used to implement the array.

Hummon, Julia M (University of Hawaii)
TITLE: Shipboard ADCP Systems and Heading Sensors: Status Reports
ABSTRACT: University of Hawaii ADCP data acquisition and processing software "UHDAS" has been installed on two Antarctic research vessels, two NOAA ships, 8 UNOLS ships, and one other vessel. A system status report status and subsampled data are emailed from these ships daily, allowing the health of the systems to be monitored. In general, the ADCPs using UHDAS are doing well. Two installations are anomalous in that they require a scale factor to be applied to the measured velocities before use. This is unusual and warrants concern. The two instruments are the OS75s on the Thompson and the Wecoma. Recent refurbishing of the HDSS sonars on the Revelle has improved their characteristics, but there is evidence of small biases at low speeds. These are not understood. High quality ADCP data relies on a good installation of the transducer, and consistent feeds of gps position and high quality headings. Many different heading devices are used, including mechanical gyro, optical gyro, gps arrays (eg. Ashtech, gps compass), and more expensive systems that combine inertial sensors and gps arrays with Kalman filters (eg. POSMV, Seapath). Heading errors result in cross-track errors in the ADCP data which are proportional to the ship's speed. Heading errors should be kept to under a few tenths of a degree to keep the errors in the ADCP data under a few cm/s (Most open ocean velocities are under 20cm/s.) We use a gyro for smoothness and reliability and correct those headings with another instrument. Ashtech, Seapath, and POSMV are capable of high accuracy and are the preferred final heading reference. Some other devices (Phins, Marinus, Mahrs) may be adequate, with errors of a few tenths of a degree. Some gyros are quite bad, especially in high latitudes, having errors of several degrees. Newer gyros with a gps feed seem to be much better than older gyros. Preliminary tests of two "gps compass" devices indicate that they are not a replacement for the high-accuracy devices. Limited

data from a Furuno "satellite compass" suggests that it is comparable to the better mechanical gyros. The CSI "gps compass" is far worse than any other device tested, with large excursions unflagged by its own QC.

Keijzer, Edwin (Netherlands Institute for Sea Research)
TITLE: Fast Thermistor String Model 3
ABSTRACT: In order to monitor fast and vigorous internal waves in the ocean NIOZ had developed a fast Thermistor String. Using this Thermistor String at sea several problems occurred, such as: complex cabling and water intrusion. For this reason a new version was developed. The major features of the new – model 3 – Thermistor String are: no connecting cables anymore, stand alone sensor units, local data storage and 2 year stand alone battery capacity. The presentation will describe the development process of the model 3 Fast Thermistor String and will explain the working of it.

Keijzer, Edwin (Netherlands Institute for Sea Research)
TITLE: New Water Sampler Valve: High Opening Ratio And Inert Material
ABSTRACT: Water sampling using Niskin-bottles or other types of bottles is regarded as a standard method. On the other hand our scientists are facing several drawbacks in these systems, such as: restricted refreshment rate (opening ratio), closing control uncertainties, contaminating materials and user-unfriendly preparation. At NIOZ an idea is being developed about an improved closing valve. This valve will be explained and demonstrated.

Kondo, Tomoe (Nippon Marine Enterprises, ltd.)
TITLE: The "HDTV" on *Hyper Dolphin*
ABSTRACT: The presentation introduces the "HDTV" installed on Hyper Dolphin (ROV of 3000m Depth Class) and its effective use for the operator. The presentation will include the HDTV specifications (including effective use) and pictures taken by the HDTV (Deep sea animals and plants, etc.).

Lefort, Olivier (Ifremer) and Nokin, Marc (Ifremer)
TITLE: R/V *Pourquoi Pas* ? A New Multidisciplinary Vessel for Ocean Research
ABSTRACT: This paper gives a general description of the *Pourquoi pas?*, the new research ship of Ifremer, in terms of missions, functionalities and main particularities. It presents how this new ship, that was delivered in May 2005, is integrated among the existing fleet and focuses on the ability of the ship to accommodate and to deploy underwater systems.

Lerner, Steven (Woods Hole Oceanographic Institution)
TITLE: The Frame-Grabber System for Integrated Content and Data Access
ABSTRACT: Today's scientific vessels generate large amounts of data collected from a variety of sensors. Although all the data is logged via shipboard dataloggers, it is difficult for scientists to re-create this integrated information and have the ability to view and access an entire cruise in an integrated fashion. We present a methodology of using data snapshots to address these needs on-ship and on-shore.

Maffei, Andrew (Woods Hole Oceanographic Institution)
TITLE: SW06 Data Handling
ABSTRACT: During the summer Shallow Water 2006 experiment logistics information for 25 PIs, 6 ships, 8 gliders, 3 REMUS class AUVs, 64 surface and subsurface moorings, 2 aircraft, and 4 drifting moorings that were inter-connected with HiSeasNet and SWAP (wifi) was made available to researchers on all vessels (and on shore) in near-real-time using a new software tool called ExView.

Martin, Toby J (Oregon State University)
TITLE: Wecoma Network Security Status
ABSTRACT: Network security on R/V Wecoma, the good, the bad, the ugly.

Martin, William H. (University of Washington)
TITLE: R/V *Thomas G Thompson* Network and Computer Security
ABSTRACT: PowerPoint presentation on the security procedure used aboard the R/V *Thomas G. Thompson*.

Matthew, Duncan (National Oceanography Centre, Southampton)
TITLE: Towed Ocean Bottom Instrument (TOBI) - Upgrades for the 21st Century

ABSTACT: A new phase of development will keep The Towed Ocean Bottom Instrument (TOBI) at the forefront of deep-ocean research well into the 21st century. Since its inception TOBI has been kept up-to-date through a series of improvements and developments linked to scientific requirements. The latest upgrades, funded by NERC primarily for the benefit of UK marine science community, will include a state-of-the-art bathymetry sonar giving a co-registered data set with the existing sidescan, a high bandwidth fibre-optic communications link, a vehicle-specific underwater navigation system and a strap-down gyro. TOBI's major role as a geological survey tool has lately been widened with the addition of light scattering sensors. Recent cruises on the German research ship FS Meteor and NERC ship RRS Charles Darwin have used TOBI to survey the Mid Atlantic Ridge near Ascension Island and locate new areas of hydrothermal activity. The data from TOBI was then used as a guide for further high detailed exploration of these areas using ROVs and AUVs.

Matthias, Paul K. (Raytheon)
TITLE: Seafloor Search with Remote Sensing
ABSTRACT: Many miles of navigated side scan sonar, sub bottom profiler and magnetometer data collection and analysis collected over two decades have identified techniques for maximizing data and image quality. We review some of these techniques, as well as some of the challenges and lessons learned associated with their application.

Miura, Atsumori (Nippon Marine Enterprises, ltd.)
TITLE: The first year of ROV "*KAIKO 7000*"
ABSTRACT: We produced the 2nd vehicle after the accident happened in 2003 to lose the original vehicle of "KAIKO". The name of the 2nd vehicle is "*KAIKO 7000*." I will introduce the operation in the first year of "*KAIKO 7000*," and also the problem found in the operation. The main Operation in the first year is as follows.

- Operation for ODP
  - Acquisition of Data from Seismometer set up at the sea bottom
  - Acquisition of Data from A-CORK
  - Advanced Circulation Obviation Retrofit Kit
- Sampling of rocks by separated towing mode in large area.

Nikanorov, Ilya (University of Miami)
TITLE: The Quality Improvement and Control System (QuIC System)
ABSTRACT: The Quality Improvement and Control (QuIC) System is web-based, automated software which provides complete control over inventory, documentation, logbooks and allows knowledge base communications. All factors are critical for successful operations of UNOLS marine technical groups. Many issues have been addressed by this system including timely calibration protocols, equipment history tracking, software maintenance, warranty information and streamlining the day-to-day operation of marine technology departments. This invaluable tool offers a central location for use at sea, ashore, or from home, with any web interface.

Nokin, Marc (Ifremer) and LeFort, Olivier (Ifremer)
TITLE: R/V *Pourquoi Pas* ? A New Multidisciplinary Vessel for Ocean Research
ABSTRACT: See listing for Lefort, Oliver

Ober, Sven (Netherlands Institute for Sea Research)
TITLE: A New Ultra Clean CTD-System for Sampling of Trace Elements and Isotopes
ABSTRACT: The traditional way of ultra clean sampling of ocean waters for trace elements and isotopes is a very time-consuming and cumbersome process. A novel rectangular titanium CTD-frame was designed and constructed, holding 2 rows of 12 GoFlo samplers as well as a complete set of CTD-sensors. Due to the rectangular shape of the frame it is possible to move the frame inside of a custom made Clean Air Container. This enables sub-sampling and processing of samples in a clean environment without back-breaking sample bottle manipulation. This new approach is also very time-efficient: only 3 hours (instead of 10) for a complete 24 depth deep-ocean trace metal sampling cast including a CTD-profile. Testing and inter-calibration of the method has been done during a cruise in November 2005.

Okada, Satoshi (Nippon Marine Enterprises, LTD.)
TITLE: Roles of Nippon Marine Enterprises, Ltd. Marine Technicians in Research Submersible Cruises
ABSTRACT: NME Research Associates often participate in scientific research cruises conducted by JAMSTEC (Japan Agency for Marine-Earth Science and Technology) on science parties' demands. Research associates are

responsible for the management of various scientific data such as geo-magnetic data, gravity data, navigational data and image data obtained during the cruises. These data are gathered by sensors prepared by scientists, or those attached to the research vessels and to such manned and unmanned deep submergence vehicles as "Shinkai 6500" and "Kaiko". To ensure the scientific application of those data, Data inventory sheets are made, in which information about the conditions under which data are obtained and auxiliary data necessary for scientific use of the data are written. Some times primary data quality controls are also done for the decisions of the survey strategy on board. Jobs of research associates onboard the vessel will also be introduced and a flow chart will be shown.

Rowe, Patrick (Woods Hole Oceanographic Institution)
TITLE: Hot Glue... And you thought it was just for arts and crafts!
ABSTRACT: A brief look at a unique method for water proofing cable splices used in underwater applications.

Schilling, Jack (Netherlands Institute for Sea Research)
TITLE: Improved Mooring Cable Stopper – Jack Schilling
ABSTRACT: During Inmartech 2004 we showed a short video impression with the title: "A safe way to deploy deep sea moorings". In this a new way of deploying deep sea moorings it was demonstrated how to connect current meters, sediment traps etc. in a safe way. In the meantime, two years later, we had made a few modifications so that the cable stopper gives us more profit when we deploy and recover a deep sea mooring.

Schmidt, Val E (University of New Hampshire)
TITLE: Two Data Management Tools for Oceanographic Research
ABSTRACT: Media-prep: A perl script to partition large data archives into media sized chunks in preparation for archival, Elog: A digital electronic logbook for metadata collection.

Schmidt, Val E (University of New Hampshire) and **Martin, Toby** (Oregon State University)
TITLE: Ship to Ship/Ship to Shore Wireless Access Protocol (SWAP)
ABSTRACT: The state of the Ship-to-Ship/Ship-to-Shore Wireless Access Protocol (SWAP) program will be reviewed including system design, current operations and installations around the fleet. A report will be made regarding progress made during the recent SWAP development weekend as well as additional planned upgrades and modifications. Time will be provided for questions and a moderated discussion.

Senior, Stephen (Woods Hole Oceanographic Institution)
TITLE: International Shipping: Dealing with New Regulations
ABSTRACT: The manager of the Shipping Department at Woods Hole Oceanographic Institution will explain recent regulation changes in the transportation industry, identify required documentation, outline basic steps to a successful shipment and provide resources for further information.

Shibata, Hidenori (Nippon Marine Enterprises Ltd.)
TITLE: Improvement of Air-gun System for Multi-channel Seismic Survey
ABSTRACT: JAMSTEC has two seismic survey systems one on R/V *Kairei* and the other on R/V *Kaiyo*. Each system uses 8 big size air-guns (1,500 cu inch each and 12,000 cu inch total) for seismic signal sources, and we have experienced various troubles related to the air-gun systems since the beginning of their operations. Moreover, as R/V *Kairei* and R/V *Kaiyo* were designed as multi purpose research vessels, use of large deck spaces for the operation of seismic survey system was not allowed. Accordingly, in the old systems, dangerous on deck works near the high pressure air compressed air-guns were inevitable. When the towing flame was cracked in 2004, we decided to make new air gun systems to eliminate the causes of troubles experienced till that time and improve their operability and safety. Stainless steel circular pipe strength members through which cables and air lines ran, were replaced by stainless steel beams of H shaped cross section. This change made the installations of cable and air hoses much easier. High pressure air supply systems were also modified to avoid dangerous launch and recovery operations of the air-gun towing frames near pressurized air guns.

Smit, Marck G (Netherlands Institute for Sea Research)
TITLE: Pressure Retaining Deep-sea Sampler
ABSTRACT: Most studies about the biological and bio-chemical processes in the deep-sea assume that pressure does not affect the measurements. A few comparative data indicate however that the hydrostatic pressure has a considerable effect on bacterial production and respiration. For these purposes a *pressure retaining deep-sea*

sampler was developed at Royal NIOZ. The presentation will describe the development process of the NIOZ High Pressure Sampler and explain the working of it.

Smith, Shawn R. (The Florida State University)
TITLE: The SAMOS Data Assembly Center
ABSTRACT: An overview of the data assembly center (DAC) for the Shipboard Automated Meteorological and Oceanographic System (SAMOS) Initiative will be provided. The presentation will include results of the 2005 pilot project, including updates on vessels contributing observations, the ship profile database, and issues that arose during initial implementation. A summary will outline the data flow and quality control procedures applied to all observations provided to the DAC. The benefits of participating in the SAMOS initiative will be described in relation to both the vessel operator, marine technician, and downstream data users. Examples of two way communication between SAMOS DAC and pilot project vessels will show how near real-time data evaluation on shore can benefit observers at sea. The DAC plans to recruit additional vessels at INMARTECH. Information on how to participate in SAMOS will be provided to interested vessel operators. The talk will emphasize the importance of detailed metadata to ensure data collected is useful for future generations of researchers. Proper sensor exposure will be highlighted as a way to make substantial improvements to data quality.

Smith, Shawn R. (Florida State University)
TITLE: Guide To Making Climate Quality Meteorological And Flux Measurements At Sea
ABSTRACT: Description of your demonstration or product: A handbook and training materials developed by Frank Bradley and Chris Fairall as part of the SAMOS and WCRP Working Group on Surface Fluxes. This manual is intended for a wide readership. Primarily it is for the guidance of scientists and technicians who are responsible for the installation and/or maintenance of meteorological equipment on board ships, whether research vessels specifically engaged in air-sea studies, ships able to provide relevant data of opportunity, or commercial vessels recruited as part of the Voluntary Observing Ship network.

Walden, Barrie B. (Woods Hole Oceanographic Institution)
TITLE: Underway Data Collection System
ABSTRACT: The research vessels and manned submersible of the Woods Hole Oceanographic Institution utilize a versatile data collection software application written to simplify common tasks faced by marine technical support personnel. This presentation will provide an overview of the system's present capabilities and underlying architecture. Strengths, weaknesses and developments for the future will be discussed.

Walden, Barrie B. (Woods Hole Oceanographic Institution)
TITLE: Metal-Free Instrumented Block and Light Weight .322 Wire Block
ABSTRACT – WHOI has developed two rigging blocks useful under a variety of conditions. The first is a metal-free, large diameter block providing a speed and wire out measurement capability. Data can be provided to a display or logging device as an RS232 serial stream via a cable or as a wireless transmission. The second block was developed for use with .322 CTD cable under less-than-ideal fair-leading conditions. The block's light weight minimizes the sheave side loading necessary to pull the block into the correct orientation.

Walden, Barrie B. (Woods Hole Oceanographic Institution)
TITLE: Field Repairable Slip Rings
ABSTRACT: A number of failures and the associated repair costs has resulted in development of a hydrographic winch slip ring assembly that can be repaired in the field for minimal expense. Surprisingly, after approximately six years of service, the prototype required its first repair last month; the replacement parts cost about $30.00.

Walden, Barrie B. (Woods Hole Oceanographic Institution)
TITLE: Far-End cable Tension Monitor
ABSTRACT – Experience shows that CTD cables are most likely to fail at the instrument end rather than at the head block where conditions would seem to be the most severe. There have been many cases where an instrument has been recovered in what was judged to be one lowering short of wire failure based upon armor "bird caging" a short distance from the termination. The thought is that this condition results from a combination of wire lowering speed, ship motion, instrument weight and drag such that the wire goes slack at the instrument and is then subjected to snap loading. This situation is difficult to detect using conventional winch monitoring instrumentation so, to test the theory, WHOI purchased a load pin for use at the cable's connection to a CTD. Evaluation is still in progress but

it appears that this device has allowed us to correctly detect slack conditions and these conditions have resulted in severe damage to the cable.

Wooding, F. Beecher (Woods Hole Oceanographic Institution)
TITLE: Ocean Bottom Seismometry at Woods Hole Oceanographic Institution-Toward a Permanent Presence
ABSTRACT: A brief history of Woods Hole Oceanographic's seismic instrumentation will be presented, with emphasis on the evolution toward the current long deployment seismographs. New projects involving permanent sensors will be discussed.

Yoerger, Dana R. (Woods Hole Oceanographic Institution)
TITLE: The ABE and Sentry Autonomous Underwater Vehicles
ABSTRACT: This talk presents recent operational deep-water survey results from the Autonomous Benthic Explorer (ABE). Specific examples include bathymetry and magnetic survey, plume localization, hydrothermal vent site photo survey. Recent development progress with the Sentry AUV is also summarized.

Tuesday Evening, October 17th: Facility Tours and Demonstrations Abstracts for Posters/Displays

(Listed alphabetically by presenter)

Fairall, Chris W. (NOAA Earth Science Research Laboratory)
DEMONSTRATION TITLE: The NOAA Portable Seagoing Air-Sea Flux Standard
DEMONSTRATION DESCRIPTION: The air-sea interaction group at ESRL/PSD (formerly ETL) is constructing a 3rd -generation flux measurement system to use as a portable standard to promote the quality assurance of NOAA and UNOLS R/V's and other components of the Ocean Observing System (principally buoys). The system is nearing completion and the first field deployment is planned in 2007. Components of the system will be shipped to Woods Hole and assembled for demonstration at the WHOI pier next to the R/V Oceanus. Some background information is provided below: . Requirement: There is a need for air-sea flux measurements of high accuracy and high time resolution - Intensive field programs - Satellite retrievals - NWP/Climate model products - Climate monitoring . Relevant quantities: Turbulent fluxes (stress, sensible and latent heat), radiative fluxes (solar and IR), precipitation, bulk meteorology (wind speed, air temperature, humidity, SST). . Potential: Present technology allows measurements of net heat input to the ocean from ships and buoys to an accuracy of about 10 W/m2, but this accuracy is not being realized on most platforms . Solution: Implement a multi-faceted program of quality assurance, intercalibration, and data archiving. - Research Vessels (NOAA, UNOLS, Navy, Coast Guard,..) - VOSClim . Strategy: Create a ship flux measurement group - Construct a state-or-the-art portable flux standard that can be installed on any ship to obtain best possible characterization of the relevant variables - Construct a distributed set of sensors to be place with ship sensors for side-by-side intercomparison . Implementation: - Work with each ship operator to improve sensor suite, placement, connection methods, processing, etc - Perform a computational fluid dynamics (CFD) assessment of the flow distortion effects for specific sensor locations - Set up a web site with a Flux Manual detailing procedures and best practices for measurements from ships and flux estimation methods

Hartz, Steven J (University of Alaska)
POSTER TITLE: Alaska Region Research Vessel
POSTER DESCRIPTION: Overview of the future U.S. National Science Foundation research vessel for the Alaska region

Iino, Testuharu (Marine Works Japan Ltd.)
POSTER TITLE: Technical Services of Marine Works Japan Ltd.
POSTER DESCRIPTION: Japan Marine Works Japan Ltd. (MWJ) has about 160 marine technicians, and they provide various scientific services on activities of Japan Agency for Marine-Earth Science and Technology (JAMSTEC). The marine technicians of MWJ support extend into operation and maintenance of onboard equipments and data quality control. Some member of marine technicians takes charge of technical development and their division is named Marine Technology Development Section. The marine technicians have many technical problems such as Machinery, Electricity, Database, and Software in marine research. It is tackling so that the problem for which special knowledge is needed also in it can be coped with. Moreover, analysis accuracy of marine research apparatus and technical development business about the improvement in functional are also performed. We have developed about more than 30 products from 2001, and introduce about three products of them. 1) "Mr. Moor" (The software for designing of 0ceanographic moorings) The "Mr. Moor" can be used to assist in the design and configuration of single point oceanographic moorings, such as the tension of mooring, the shape of mooring after deployment. The "Mr. Moor" is for a sub-surface mooring mainly and is calculated by using the Lumped mass model. A characteristic operability of this software is the increasing number of component parts in the mooring that can be inputted, the edit function of mooring composition parts and the selectable graph functions of a calculation results. 2) "Mr. Deep" (The tow fish monitoring software) To survey the deep sea with the tow fish, the "Mr. Deep" can be used to get exact position and posture of the tow fish, and to display the detailed bathymetric chart by using SEA-BEAM data at real time on operation. The main functions are also displaying the locations of research vessel, the information of transponder, the bathymetric chart by SeaBeam, the detailed depth data measured by the CTD and the gimbal sheave data. 3) "Magnet Switch Data Logger (MSDL)" The "MSDL" can be used to check a mechanical error of the trigger that is attached on the water sampler system, and this mechanical error of the trigger is influenced by rolling and pitching of the multiple corer. The main function is apprehending the actuation time of the trigger by the magnet switch. And this is also recorded actuated on non-volatile storage on logging time. It can control the data

from a computer. The chassis of the "MSDL" is made of titanium Ti-6AL-4V and the maximum depth can be used is to 7,000m.

Matthew, Duncan (National Oceanography Centre, Southampton)
POSTER TITLE: The Acoustic Navigation Of Deep-Towed Underwater Imaging Vehicles Using A Reversed Ultra Short Base
POSTER DESCRIPTION: Background of the development, in-house R & D to prove the concept and finally getting a commercial company interested in developing and manufacturing a system. (No heavy advertising!).

Oyama, Ryo (Global Ocean Development Inc.)
POSTER TITLE: The Technology Improvement of Radiosonde Observation and Evaluation Character of the Humidity Sensor
POSTER DESCRIPTION: We have the atmospheric soundings by radiosonde on R/V Mirai since 1997. Vaisala sounding system and RS-80 sensor had been used. In 2004, a new sensor RS92-SGP (RS92) which is compact and light weight was introduced. It improved sensor precision and made the operation easy. However, after this change, we sometimes happen to have a trouble that the radiosonde sensor collides with a launcher at release, consequently RS-92 has damaged. In addition, RS80 had dry bias in its humidity sensor (Wang et al. 2002, etc) and the humidity sensor of RS92 was added some new features. So we think that it is necessary to be sure that RS92 doesn't have dry bias and the other new problems. To prevent the sensor from the collision with launcher, we adjusted the length of thread between the radiosonde sensor and the balloon before release. As a result, we could found an appropriate length and launch all the soundings without a trouble under moderate wind condition (10m/s). We also tried a system that lift up the sensor from the bottom to the top of launcher as a countermeasure of the strong wind condition. Though it remained some problems to be solved, we could be sure that it would be useful. In relation to humidity sensor of RS92, we examined its response with comparing humidity calibrators and confirmed that highly precise humidity data (the accuracy is better than 1 %) could be acquired with RS92. One example of the new features is that RS92 is equipped with two humidity sensors. When one sensor measures humidity, another sensor is heated to remove the water drops on the humidity sensor. Changing the role alternately keeps their accuracy. So we also investigated its heating influence under the different wind condition. As a result, it is found that the acquired humidity data by RS92 shows the influence of heating on the weak wind condition (2.3m/s). It was confirmed that the influence of heating is nothing in the actual sounding (with ascending about 3.5m/s).

Ozawa, Satoshi (Marine Works Japan LTD.)
POSTER TITLE: Temperature Error Caused By Attitude Motion of Sea-Bird 9plus CTD.
POSTER DESCRIPTION: A periodical temperature error seen in the CTD data is examined by comparing with the attitude motion of the CTD measured by an ADCP. The CTD system was composed of a Sea-Bird 9plus CTD (two sets of temperature and conductivity sensors) and 12-litter Niskin bottles on 36-position Carousel Water Sampler. The ADCP (RDI Workhorse Monitor, 300 kHz) was attached to the water sampler frame and lowered along with the CTD system. The CTD and the attitude motion data were obtained under several operating conditions by changing the weight of the water sampler frame and lowering with or without a plate which minimize a rotating motion of the CTD system. Vertical profiles of the temperature difference between the two temperature sensors obtained at down-casts (nominal descent rate was 1.2 m/s) are examined. For operating conditions without the plate, the difference periodically fluctuates even in the deep ocean where the vertical temperature gradient is small. The maximum peak-to-peak difference is about 0.0006 degrees C with a period of about 3.5 minutes which corresponds to a wavelength of about 250 m. Similar fluctuation is seen in the salinity difference (maximum peak-to-peak difference is about 0.0006), although it is not seen in the conductivity difference. Therefore the fluctuation of the salinity difference is found to be caused by the temperature fluctuations. The periodical fluctuations in temperature difference are compared with the attitude motion of the CTD. The period of the fluctuation completely agrees with the period of tilting and rotation of the CTD system. Although the tilting (maximum angle of 25 degrees) may cause discrepancy of temperature between the two temperature sensors by changing vertical positions of the two sensors (maximum distance of 30 cm), the fluctuation in temperature difference must be caused by other reason because vertical gradient of temperature is too small (less than 0.0001 degrees C per 30 cm) in the deep ocean to explain the temperature difference. The fluctuation of the tilting may change slightly a flow rate of the pump-controlled flow in the T-C duct which connects the temperature probe and the conductivity cell. The periodical temperature errors related to the tilting are likely to be caused by changing viscous heating around the temperature probe.

Takahashi, Naoko (Marine Works Japan LTD.)

Poster Title: Our Useful Techniques for Bottle Salinity Measurements
Poster Description: Bottle salinity data are obtained to calibrate CTD data as well as get the value of salinity in Oceanography. We employ a specific method described in Aoyama et al., (2002) in order to make a precise measurement on the salinometer, Model 8400B "Autosal", manufactured by Guildline Instruments Inc. In the sequence of salinity measurements, we measure the IAPSO Standard Seawater (SSW) provided by Ocean Scientific International Ltd. to know the precision of measurement. We keep the standard deviation of SSW and that of absolute differences for replicate samples, which indicates "overall" precision, were under 0.001 in salinity (PSS-78) in the last few years. These values satisfy the WOCE requirements. In the poster, we will show you about our useful techniques for sampling, data acquisition, and maintenance of AUTOSAL in detail.

Zettler, Erik R. (Sea Education Association)
POSTER TITLE: Sea Education Association oceanographic training vessels as Ships of Opportunity
POSTER DESCRIPTION: Describes equipment and cruise tracks of SEA vessels in Atlantic and Pacific. Since Cramer won't be at dock, would be nice to show people this at least.

Vendor Facility Tours and Open Houses

Open House at McLane Research Laboratories, Inc. (www.mclanelabs.com) on Friday, October 20th (after the INMARTECH conference).

Please stop by on your way out of town and tour the manufacturing and testing facility for Sediment Traps, Moored Profilers, Water Samplers, Large-Volume Pumps, and Glass Flotation. Directions can be found on our website: <http://www.mclanelabs.com/directions.pdf>

In addition, you are welcome to visit any day during the conference. Please call (+1 508 495 4000) or email (mclane@mclanelabs.com) to arrange a time and/or a ride from Woods Hole.

Open House at Falmouth Scientific, Inc. (www.falmouth.com) on Friday, October 20th.

Please stop by and visit our manufacturing facility. FSI is a leading manufacturer of precision oceanographic instrumentation and specialty systems including current meters, CTDs, wave gauges, acoustic systems, AUV's, specialty transducers and other sensors.

Please contact us at 1 508 564-7640 if you need transportation or would like to visit on a different day. Ask for Rick Babicz at ext 103 or Frances Lewis-Souza at ext 107.

Open House at Webb Research Corporation (www.webbresearch.com) on Friday, October 20th. (after the INMARTECH conference).

WRC develops and manufactures instruments used in ocean research, including APEX profiling floats, SLOCUM autonomous gliders, and moored acoustic sources.

We are located in the Falmouth Technology Park, off of Thomas Landers Road, in North Falmouth.
Please email (dwebb@webbresearch.com) or call 508-548-2077 ext. 106 to arrange a time.

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