

PASSIVE'08

Hyères, French Riviera, France

October 14-17, 2008

**An IEEE Workshop & Exhibition on
New Trends for Environmental Monitoring using
Passive Systems**

sponsored by the IEEE Oceanic Engineering Society



Final Program

www.passive08-hyeres.org

Plenary Session

Îles d'Or II

Wednesday, October 15 (9:45AM - 11:45AM)

Welcoming Speech

Philippe COURMONTAGNE, ISEN-Toulon
René GARELLO, Telecom Bretagne

Introduction to Passive Systems and their relevance

Eveline SPINA, Pôle Mer PACA

OCEANS'09 Bremen

Christoph Waldmann, Marum

KEYNOTE SPEAKERS

Passive Systems for Marine Mammal Study

Olivier Adam, Paris 12 University

Abstract

The underwater acoustics observatories allow us to detect the presence of marine mammals. These observatories present some advantages: they allow for continuous observation and are non-dependent on the weather conditions. These acoustic observations complement visual observations or other techniques. New technologies and recent methods developed in signal processing, underwater acoustics, and pattern recognition strongly support the use of passive acoustics for these observations. The recordings of sounds emitted by cetaceans give fundamental information about the behavior and the movements of the species. Another goal is to characterize their environment, for example by measuring the underwater noise impact or estimating the risk of ship collisions.

Presenter's Bio

Olivier ADAM received a diploma in Electronic Engineering and a PhD degree in Signal Processing from the University of Paris (France) in 1991 and 1995 respectively. He is Habilitate Associate Professor at the University of Paris where he has been teaching electronics, physics, signal processing and pattern recognition since 1995. His research interests include detection, identification and acoustics propagation. Currently, his research project consists in developing an autonomous system for the detection, localization and tracking of marine mammals using passive acoustics which can be implemented on acoustic observatories (Mediterranean Sea, Austral Ocean and Indian Ocean). The analysis is done on sounds emitted by different species (sperm whales, humpback whales, killer whales...) based on modern approaches developed in signal processing and pattern recognition.

Most recent development of passive radars at THALES Air System

Jean-Marie FERRIER, Thales

Abstract

The keynote speech will address on the most recent development of passive radars at THALES Air System. Namely the presentation will be discussing the development of:

- The HA100 radar: passive radar system with FM working frequency (analogic FM radar)
- A prototype of a passive system with UHF working frequency (digital TV)

Presenter's Bio

Jean-Marie Ferrier is heading the THALES/ Air System office with the mission of developing new civil and military ground radar concepts. Presently he is involved in three main research domains:

- Centrimetric wavelength radar evolutions: digital radars, new wave patterns, new architectures
- Low frequency band radars: short/ medium/ long range warnings
- Passive radars: cooperative and non-cooperative modes (PCL or Passive Coherent Location)

ANTARES - Ocean acoustic observatories

Port Cros

Wednesday, October 15 (1:30PM - 3:00PM)

Co-Chairs: **Olivier ADAM**, *LISSI - Université Paris 12*

Claude JAUFFRET, *IM2NP*

A proposed architecture for marine mammal tracking from globally distributed ocean acoustic observatories

Eric DELORY, *dBscale Environmental Sensing*

Christoph WALDMANN, *University of Bremen/MARUM*

Janet FREDERICKS, *Woods Hole Oceanographic Institution*

A real time seismological station at 2500m depth in front Toulon.

Anne DESCHAMPS, *Géosciences Azur*

Yann HELLO, *Géosciences Azur*

Philippe CHARVIS, *Géosciences Azur*

Tanit FRONTERA, *Institut Geològic de Catalunya*

Carl GOJAK, *Division Technique de l'INSU*

Detection and localization of very high energy neutrinos by a passive underwater acoustic telescope

Claude JAUFFRET, *IM2NP*

Nicolas JUENNARD, *IM2NP*

Bernard XERRI, *IM2NP*

Passive acoustic storey of the ANTARES neutrino detector for real-time cetaceans detection, localization and behavior studies

Olivier ADAM, *LISSI - Université Paris 12*

Hervé GLOTIN, *UMR6168-LSIS*

Localization & Detection

Port Cros

Wednesday, October 15 (3:30PM - 5:00PM)

Co-Chairs: **Christoph WALDMANN**, *University of Bremen/MARUM*
Philippe COURMONTAGNE, *ISEN-Toulon*

Acoustic Detection of Ice cracking events

Christoph WALDMANN, *University of Bremen/MARUM*

Aneta NIKOLOVSKA, *University of Bremen/MARUM*

Background spectral estimation via robust Kalman filtering

Christophe FRASCHINI, *SuperSonic Imagine*

CHAILLAN FABIEN, *DCNS*

ENHANCED UNDERWATER ACTIVE TELEMTRY

Sami HARARI, *ISIT/USTV*

Signals of opportunity

Porquerolles

Thursday, October 16 (8:30AM - 10:00AM)

Co-Chairs: René GARELLO, *TELECOM Bretagne*

Marc THOMAS, *University College London*

Project MOPS - Marine Opportunity Passive Systems

Arnaud COATANHAY, *ENSIETA*

René GARELLO, *Telecom Bretagne*

ChapronBertrand CHAPRON, *Ifremer*

Fabrice ARDHUIN, *SHOM*

HF Passive Bistatic Radar Potentials and Applications for Remote Sensing

Marc THOMAS, *University College London*

Chris BAKER, *University College London*

Hugh GRIFFITHS, *DCMT*

GPS ISAR Passive System Characterization using Point Spread Function

Frederic MAUSSANG, *TELECOM Bretagne*

Franck DAOUT, *SATIE, ENS Cachan*

Guillaume GINOLHAC, *SATIE, ENS Cachan*

Francoise SCHMITT, *SATIE, ENS Cachan*

Marine Mammal Tracking

Port Cros

Thursday, October 16 (8:30AM - 10:00AM)

Co-Chairs: **Philippe COURMONTAGNE**, *ISEN-Toulon*

Eva-Marie NOSAL, *University of Hawaii at Manoa*

Robust smoothing to improve position estimates of marine mammals

Ildar URAZGHILDIIEV, *Bioacoustics Research Program, Cornell Laboratory of Ornithology*

Chris CLARK, *Bioacoustics Research Program, Cornell Laboratory of Ornithology*

Flood-fill algorithms used for passive acoustic detection and tracking

Eva-Marie NOSAL, *University of Hawaii at Manoa*

Stochastic Matched Filter outperforms Teager-Kaiser-Mallat for tracking a plurality of sperm whales

Frédéric CAUDAL, *LSIS-USTV*

Hervé GLOTIN, *LSIS-USTV*

An Improved Nearest Neighbor Data Association Method for Underwater Bearing only Multi-Target Tracking

Behnam BANITALEBI, *ERI*

Hadi AMIRI, *JERC*

Airborne Observation & Measurements

Porquerolles

Thursday, October 16 (10:30AM - 12:00PM)

Co-Chairs: **Sebastien GUIMBARD**, *Ifremer*

Stephane SAUX PICART, *Ifremer*

PASSIVE BISTATIC RADAR (PBR) USING FM RADIO ILLUMINATORS OF OPPORTUNITY

Daniel O'HAGAN, *University College London*

Chris BAKER, *University College London*

Impact of surface Roughness on L-band emissivity of the Ocean

Sebastien GUIMBARD, *Ifremer*

nicolas REUL, *Ifremer*

Assessing ocean salinity retrieval using WindSat data over the Amazone River Plume and North Brazil Current retroflection

Stephane SAUX PICART, *Ifremer*

Nicolas REUL, *Ifremer*

Detection & Classification I

Port Cros

Thursday, October 16 (10:30AM - 12:00PM)

Co-Chairs: Xavier MOUY, *JASCO Applied Sciences Group*

Hervé GLOTIN, *LSIS*

A comparison of methods for the automatic classification of marine mammal vocalizations in the Arctic

Xavier MOUY, *JASCO Applied Sciences Group*

Del LEARY, *JASCO Applied Sciences Group*

Bruce MARTIN, *JASCO Applied Sciences Group*

Marjo LAURINOLLI, *JASCO Applied Sciences Group*

PELAGIC DELPHINIDS OF THE MEDITERRANEAN SEA HAVE DIFFERENT WHISTLES

Alexandre GANNIER, *Groupe de Recherche sur les Cétacés*

Sandra FUCHS, *GREC*

Julie OSWALD, *University of Hawaii*

Development of a Modular Mixed Sensor Acoustic Towed Array for Marine Mammal Detection and Localization

Bruce MARTIN, *JASCO Applied Sciences Group*

Stephen TURNER, *JASCO Applied Sciences Ltd.*

Scott CARR, *JASCO Applied Sciences Ltd.*

Vignesh BADRINARAYANAN, *JASCO Applied Sciences Ltd.*

Detection and recognition of fin whales and North Atlantic right whales off the coast of Massachusetts

Ildar URAZGHILDIIEV, *Bioacoustics Research Program, Cornell Laboratory of Ornithology*

Chris CLARK, *Bioacoustics Research Program, Cornell Laboratory of Ornithology*

Tim KREIN, *Bioacoustics Research Program, Cornell Laboratory of Ornithology*

Oceanic Transitions

Porquerolles

Thursday, October 16 (1:30PM - 3:00PM)

Co-Chairs: SERGE REBOUL, *Laboratoire d'Analyse des Systemes du Littoral- EA 2600*

René GARELLO, *TELECOM Bretagne*

Altimeter Wet Tropospheric Correction in Coastal Regions

Desportes CHARLES, *CLS*

Obligis ESTELLE, *CLS*

PICARD BRUNO, *CLS*

Beach soil moisture measurement with a land reflected GPS bistatic radar technique

Qi LI, *Universite du Littoral Cote d'Opale*

Serge REBOUL, *Universite du Littoral Cote d'Opale*

Serge REBOUL, *Universite du Littoral Cote d'Opale*

Stanislas BOUTOILLE, *Universite du Littoral Cote d'Opale*

Antoine GARDEL, *Universite du Littoral Cote d'Opale*

Jean-Bernard CHOQUEL, *Universite du Littoral Cote d'Opale*

Mohammed BENJELLOUN, *Universite du Littoral Cote d'Opale*

Dynamical Processing of Remote Sensing Imagery for Hydrological Resources Management

Ivan VILLALON-TURRUBIATES, *University of Guadalajara*

Detection & Classification II

Port Cros

Thursday, October 16 (1:30PM - 3:00PM)

Co-Chairs: **Olivier ADAM**, *LISSI - Université Paris 12*

Hervé GLOTIN, *LSIS*

High level automatic structuration of ocean passive data : from click sequence modulations to whale behavior analyses

Frédéric CAUDAL, *LSIS-USTV*

Hervé GLOTIN, *LSIS-USTV*

Automatic prosodic clustering of humpback whales song

Olivier ADAM, *LISSI - Université Paris 12*

Gautier PICOT, *MAPMO, Université d'Orléans*

Maïtine BERGOUX, *MAPMO, Université d'Orléans*

Hervé GLOTIN, *LSIS*

François-Xavier MAYER, *Association Megaptera*

Mallat's Matching Pursuit of Sperm Whale Clicks in Real-Time using Daubechies 15 wavelets

Fabien LELANDAIS, *LSIS - Univ - TLN*

Hervé GLOTIN, *LSIS - Univ - TLN*

Passive Systems: Integration & Algorithm

Porquerolles

Thursday, October 16 (3:30PM - 5:00PM)

Co-Chairs: Jacob **BARHEN**, *Oak Ridge National Laboratory*
Bruno **PICARD**, *CLS*

GSM Based Through-the-Wall Passive Radar Demonstrator for Motion Sensing

Danny TAN, *SONDRA - SUPELEC*

Marc LESTURGIE, *SONDRA - SUPELEC*

A comparison of interpolation processes: applications to across-track scanning radiometers

Bruno PICARD, *CLS*

Obligis ESTELLE, *CLS*

Denneulin MARIE-LAURE, *CLS*

FFT-Based Sonar Array Beamforming Without Corner Turning

Jacob BARHEN, *Oak Ridge National Laboratory*

Travis HUMBLE, *Oak Ridge National Laboratory*

Michael TRAWEEK, *Office of Naval Research*

Design of a Low Noise Hydrophone Amplifier

Mehdi BANIHASHEMI, *Research Institute of Agriculture Ministry*

Shahram BAYAT, *Research Institute of Agriculture Ministry*

Detection & Classification III

Port Cros

Thursday, October 16 (3:30PM - 5:00PM)

Co-Chairs: Jeffrey HAUN, *NATO Undersea Research Centre*
Varvara KANDIA, *ICS-FORTH*

SIRENA 08 -- A MARINE MAMMAL RISK MITIGATION SEA TRIAL

Jeffrey HAUN, *NATO Undersea Research Centre*

Kendra RYAN, *NATO Undersea Research Centre*

Nicola PORTUNATO, *NATO Undersea Research Centre*

Improve the accuracy of TDOA measurement using the Teager-Kaiser Energy operator

Varvara KANDIA, *ICS-FORTH*

Yannis STYLIANOU, *University of Crete*

Thierry DUTOIT, *FPMS*

A Phase based Detector of Whale Clicks

Varvara KANDIA, *ICS-FORTH*

Yannis STYLIANOU, *University of Crete*

Computer-aided classification of bowhead whale call categories for mitigation monitoring

Delphine MATHIAS, *Marine Physical Laboratory, Scripps Institution of Oceanography*

Aaron THODE, *Marine Physical Laboratory, Scripps Institution of Oceanography*

Susanna BLACKWELL, *Greeneridge Sciences, Inc*

Charles GREENE, *Greeneridge Sciences, Inc*

Detection & Classification IV

Port Cros

Friday, October 17 (8:30AM - 10:00AM)

Co-Chairs: Walter ZIMMER, *NATO Undersea Research Centre*

Odile GÉRARD, *NURC*

Analysis and Classification of Beaked Whales Buzz Clicks.

Odile GÉRARD, *NURC*

Stefano CORALUPPI, *NURC*

Craig CARTHEL, *NURC*

Estimating the number of beaked whales using an MHT tracker

Odile GÉRARD, *NURC*

Craig CARTHEL, *NURC*

Stefano CORALUPPI, *NURC*

Context dependent detection/classification of Cuvier's beaked whale (*Ziphius cavirostris*)

Walter ZIMMER, *NATO Undersea Research Centre*

Gianni PAVAN, *CIBRA/ Università' di Pavia*

Passive Tomography

Port Cros

Friday, October 17 (10:30AM - 12:00PM)

Co-Chairs: Jean-Pierre HERMAND, *Environmental Hydroacoustics Lab., OPERA-Acoustics Dept.*

René GARELLO, *TELECOM Bretagne*

TIME-FREQUENCY-PHASE COHERENCE - GENERAL FRAMEWORK FOR SIGNAL ANALYSIS IN PASSIVE CONTEXT

Cornel IOANA, *Grenoble INP/GIPSA-lab*

Andre QUINQUIS, *DET/GESMA/DGA*

Bertrand GOTTIN, *Grenoble INP/GIPSA-lab*

Passive tomography in coastal areas : a feasibility study of the Ushant front monitoring

Jean-Pierre HERMAND, *Environmental Hydroacoustics Lab., OPERA-Acoustics Dept.*

Olivier CARRIÈRE, *Environmental Hydroacoustics Lab., OPERA-Acoustics Dept.*

Yann STÉPHAN, *SHOM*

Exhibitor Profiles

CHRISAR

CHRISAR designs and sells Signal Processing Systems for Defence, Industry and Research labs. Our R&D activities and products aim to provide clients with systems for:

- Sonar processing,
- Data acquisition and processing for signature identification and classification,
- Sound simulation,
- Marine mammals observation,
- USW Training.

Our leading products are:

- CHRISAR-LAB: acquisition, analysis and measurement in real and deferred time.
- CHRISAR-SIM: simulation of ambient noise situation.
- ACSRAY: simulation of sound propagation in shallow and deep water with variable bottom.

CHRISAR is a French SME recognized by the main naval industry leaders.

Email: info@chrisar.com

Web: <http://www.chrisar.fr/>

JASCO RESEARCH LTD

Oceanographic instrumentation, acoustics consulting.

Email: scott@jasco.com

Web: www.jasco.com

OSEAN

The **OSEAN** (SAS) company is specialized in the study and the manufacturing of innovative systems performing in harsh environment.

OSEAN's headquarters are located in TOULON, on the French Riviera.

OSEAN's team has years of experience in the design of scientific and military underwater systems.

OSEAN designs and manufactures:

- Customized underwater electronic systems in the fields of: Underwater acoustics, Instrumentation, Robotics and Vision.
- High performance underwater light systems for motion picture industry, boat's hull and harbors lighting.
- Smart video surveillance systems using advanced motion detection algorithm.

OSEAN's expertise is based on a young team of experienced and passionate engineers and technicians working with the state of the art equipments.

OSEAN performs studies in the following fields: electronics, computer science, optics and mechanicals.

OSEAN is committed to manufacturing the most ruggedized and reliable products in accordance to safety and quality standards.

The quality of our product is built on the respect of industrial quality procedures and the partnership with high level suppliers.

The different steps of research and development (prototyping, testing and quality controls) are accomplished in house.

OSEAN is involved in the following technologies:

- Underwater acoustics, Ultra sound transducer,
- Very low power and low noise electronic systems,
- Measurement acquisition, Instrumentation,
- Specifics sensors development,
- Data transmission on cable, fiber optic, RF and acoustic,
- Signal processing,
- Underwater vision and Lighting,
- Mechanics in marine environment.

Email: contact.web@osean.fr

Web: www.osean.fr



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- Student poster competition

Submissions are solicited in the following fields:

Special Topics for the OCEANS '09 Bremen

- Ecology versus economy – finding the right balance
- Integrated coastal observing strategies
- Global ocean observatory initiatives
- The ocean component for earth observation programs (GEOSS Global Earth Observation System of the Systems)
- Renewable Energy – offshore wind, solar and tide energy conversion
- Advanced technologies for hydrocarbon and mineral resource exploration
- Estuary systems and Wadden areas in the North and Baltic Sea
- Marine Aquaculture
- Maritime security and surveillance



General OCEANS Topics

- Underwater acoustics and associated processing
- Ocean observing systems
- Remote sensing of atmosphere/ocean interface
- Naval and offshore technology
- Information technology and data management
- Marine environment and pollution monitoring
- Non acoustic instruments and associated processing
- Marine policy and ocean management
- Selected topics of marine research (Hydrothermal vents, Fluid seepage, Bioacoustics – Whale research)



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Web site open for abstract submission:

November 2008

Deadline for all submissions:

January 11th 2009

Deadline for full paper:

March 26th 2009

Interested in presenting a paper, a tutorial or a student poster?

For further details and abstract submission please visit our OCEANS web site:

www.OCEANS09IEEEBremen.org



Hochschule Bremerhaven

