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2011

MARELEC

June 20–23, 2011, San Diego, USA

The World's foremost conference
on **marine electromagnetics**

CONFERENCE AND POSTER PROGRAM

MARELEC 2011 is the 7th International Marine Electromagnetics conference. Keynote presentations from distinguished leaders in the various disciplines, oral presentations, posters, and exhibits will offer a broad array of opportunities to learn about the state of the art in marine electromagnetic science as well as meet the scientists of today and the students who will become leaders of tomorrow.

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2011 MARELEC CONFERENCE PROGRAM

MONDAY JUNE 20, 2011

0900 Welcome from Conference Chairman
Dr Steven Constable, Professor, Scripps Institution of Oceanography, USA

Opening Session

0910 **KEYNOTE:**
Some early marine electromagnetic experiments: The Interaction of ideas, good and bad, with available marine technology, with the aim of learning about electrical conductivity below the seabed
Charles Cox, Scripps Institution of Oceanography, USA

0935 First results From the Serpentinite, Extension and Regional Porosity Experiment across the Nicaraguan Trench (SERPENT)
Samer Naif, Graduate Student Researcher, Scripps Institution of Oceanography, USA

1000 The development of marine electromagnetic methods for mapping gas hydrates
Dr Karen Weitemeyer, Postdoctoral Scholar, University of California San Diego, USA

1025 Comparison of in-water predicted and measured magnetic fields due to Ocean dynamics
Bradley Nelson, Defence Scientist, Defence Research & Development Canada Atlantic, Canada

1050 **Poster highlights:** 10 x 2 minute poster overviews

1110 Coffee Break (*Time to meet with poster presenters and exhibit booths*)

1: Environmental Fields

Chair **Adi Bulsara**, Senior Scientist, SPAWAR-Pacific, USA

1140 A global model of the electromagnetic background noise
Dr Lisa Rosenqvist, Scientist, Swedish Defence Research Institute, Sweden

1205 Coastal Mixing and Magnetics Project - A quantified approach to an accelerated research initiative
Dr William Venezia, Chief Engineer, Naval Surface Warfare Center, Carderock Division, USA

1230 EM effects of seawater flow around a measurement capsule
David Clark, Principal Research Scientist, CSIRO Materials Science and Engineering, Australia

1255 Lunch (*Time to meet with poster presenters and exhibit booths*)

2: Remotely and Autonomously Operated Vehicles

Chair **Bradley Nelson**, Defence Scientist, Defence Research & Development Canada Atlantic, Canada

1400 Target detection with parameter inversion of vector magnetic gradiometer operating with autonomous underwater vehicle
Yuan Hang Pei, Principal Member of Technical Staff, DSO National Laboratories, Singapore

1425 Locating and Characterizing Seabed Targets Using Low-Noise Magnetic Sensors
Dr Gregory Schultz, Research Geophysicist, Sky Research Inc., USA

1450 Marine controlled-source electromagnetic sounding on submarine massive sulphides using autonomous underwater vehicle
Dr Tada-nori Goto, Associate Professor, Graduate School of Engineering, Kyoto University, Japan

1515 Coffee Break (*Time to meet with poster presenters and exhibit booths*)

3: Inverse Modelling

Chair **Dr Mike Wynn**, Distinguished Scientist, Naval Surface Warfare Center, USA

1550 Massively parallel 3D conductivity imaging of the subsurface: Applications to hydrocarbon exploration and a way forward for joint imaging of seismic and electrical data
Gregory Newman, Research Scientist, Lawrence Berkeley National Laboratory, USA

1615 Instantaneous tracking of time-varying magnetic dipole sources using vector magnetometer arrays
Jesse Angle, Scientist, Naval Surface Warfare Center, USA

1640 Joint CSEM and seismic full-waveform data inversion algorithm for geophysical exploration
-1705 Dr Aria Abubakar, Multi-Physics Modeling and Inversion Program Manager, Schlumberger-Doll Research, USA

1730 **COCKTAIL RECEPTION** on exhibit floor

TUESDAY JUNE 21, 2011**4: Vessel EM Signature Prediction and Control**

Chair **Alastair Ballentine**, Platform Systems - UW Systems, Atlas Elektronik UK Ltd, UK

0900 **KEYNOTE:**
Exploiting EM technology
Dr Geoff Garnett, Senior Scientist, DSTL, UK

0925 **Evaluating effects of roll on corrosion-related UEP using simulation**
Mr Tom Curtin, Director Engineering Services, Computational Mechanics BEASY, USA

0950 **Study of vessel magnetic treatment facility efficiency**
Dr Laure-Line Rouve, Research Engineer, G2Elab, France

1015 **On the Environmental Impact on the UEP Signature from Submarines**
Dr Frederik Silfverduk, Senior Scientist, Swedish Defence Research Agency – FOI, Sweden

1040 **Poster highlights: 10 x 2 minute Poster Overviews**

1105 *Coffee (Time to meet with poster presenters and exhibit booths)*

5: Hydrocarbon Exploration; Instrumentation, Case Studies, Data Interpretation, Theory

Chair **Dr Len Srnka**, Chief Research Geoscientist, ExxonMobil Upstream Research Company, USA

1140 **Modelling and inversion of towed EM data from the North Sea Troll field**
Dr Johan Mattsson, Section Leader, EM Research, Petroleum Geo-Services, Sweden

1205 **An inverted long-baseline navigation system for deep-towed EM transmitter systems**
Dr Kerry Key, University of California, San Diego, USA

1230 **Shallow water CSEM using a surface-towed source**
Dr Daniel Shantsev, Senior Scientist, ElectroMagnetic GeoServices, Norway

1255 *Lunch (Time to Meet with Poster Presenters and Exhibit Booths)*

6: Measurement / Instrumentation

Chair **Professor Peter Sigraý**, Research Director, Swedish Defence Research Agency – FOI, Sweden

1400 **Vector magnetometer noise reduction to enable UUV forward-area ship signature measurements**
Dr Stephen J. Potashnik, Scientist, Naval Surface Warfare Center Carderock Division, USA

1425 **An optimized model based inversion technique for pipeline tracking**
Dr Tim Fristedt, Senior Scientist, Swedish Defence Research Agency – FOI, Sweden

1450 **Low noise Ag/AgCl electric field sensor system for marine CSEM and MT applications**
Geir Bjarte Havsgård, Senior Development Engineer, ElectroMagnetic GeoServices ASA, Norway

1515 *Coffee (Time to meet with poster presenters and exhibit booths)*

7: Measurement / Instrumentation

Chair **Dr Nitin Bhakta**, Senior Scientist, Atlas Elektronik UK Ltd, UK

1550 **The Long and the Short of it - New Sensors for Marine EM Studies**
Dr Steven Constable, Professor, Scripps Institution of Oceanography, USA

1615 **Upgrading a Magnetic and Acoustic Signature Range with 3-axis Electric Field Measurement Functionality**
Dr Samantha Davidson, Research and Software Team Leader, Ultra Electronics PMES, UK

1640 **Subsea Communication and Navigation**
-1705 Dr Thomas Nielsen, Vice President of Research and Development, WFS Defense Inc, USA



2011 MARELEC CONFERENCE PROGRAM

WEDNESDAY JUNE 22, 2011

8: Vessel EM Signature

Chair **Neil Stapleton**, Principal Scientific Officer, DSTL, UK

0900 **Magnetism revisited**
Captain Rob Hendriks, Director, Centre for Ship Signature Management (CSSM), Germany

0925 **FEM analysis of magnetic treatment of submarine with Hysteresis Model**
Professor Kwang-Ho Shin, Professor, Kyungshin University, South Korea

0950 **Efficient methodology for identification of unknown magnetization on ferromagnetic ship hulls**
Professor Dong-Hun Kim, Associate Professor, Kyungpook National University, Korea

1015 **Vectorial magnetization modeling of a thin shell structure undergoing high magneto-mechanical effects in low field**
Dr Antonio Viana, Engineer, G2Elab, France

1040 **Poster highlights: 10 x 2 minute poster overviews**

1100 *Coffee (Time to meet with poster presenters and exhibiting organizations)*

9: Modelling

Chair **Peter Krylstedt**, Director of Research, Swedish Defence Research Agency, Sweden

1200 **2.5D and 3D forward modeling of marine CSEM data**
Dr Joonsang Park, Senior Geophysicist, NGI, Norway

1225 **The DINAR Equation**
Dr Cye Waldman, VP CTO, Information Systems Laboratories, USA

1250 *Lunch (Time to meet with poster presenters and exhibiting organizations)*

10: Inverse Modelling

Chair **Dr Mike Wynn**, Distinguished Scientist, Naval Surface Warfare Center, USA

1415 **Anisotropic 3D inversion of marine CSEM and MT data on PCs**
Dr Yutaka Sasaki, Assistant Professor, Kyushu University, Japan

1440 **A new approach: Multimodality conductivity imaging of marine environment**
Professor Alex Timonov, Associate Professor of Mathematics, University of South Carolina Upstate, USA

1505 **3D Joint Inversion of Marine CSEM and MT Data**
Dr Michael Zhdanov, CEO, Technoimaging, USA

1530 *Coffee (Time to meet with poster presenters and exhibiting organizations)*

11: Underwater Surveillance

Chair **Frank Gordon**, SPAWAR (Retired), USA

1600 **Holographic back-propagation of electric and magnetic sensor data for the study of ELF ship signatures**
Dr Earl Williams, Senior Scientist, Naval Research Laboratory, USA

1625 **Implementation considerations for a wireless underwater magnetometer network**
Michael Hughes, Electronics Engineer, SSC Pacific, USA

1650 **Electric field buoys - Principles and practice**
Dr Jeffrey Ridgway, Research Scientist, Information Systems Laboratories, USA

TBC **GALA DINNER - THE BIRCH AQUARIUM** at Scripps Institution of Oceanography

THURSDAY JUNE 23, 2011**12: Hydrocarbon Exploration; Instrumentation, Case Studies, Data Interpretation, Theory**

Chair **Dr Steven Constable**, Professor, Scripps Institution of Oceanography, USA

0900 **KEYNOTE:**
Challenges to electromagnetic surveying technologies for offshore hydrocarbon exploration and production
Dirk Smit, VP - Exploration Technology, Chief Scientist Geophysics, Royal Dutch Shell Plc, Netherlands

0925 **Integrating well log, seismic and CSEM data for reservoir characterization**
Dr Lucy MacGregor, Chief Technology Officer, RSI, UK

0950 **Seafloor characterization by electromagnetic benthic profiling**
Dr Hendrik Müller, Geophysicist, University of Bremen, Germany

1015 **Navigation and resistivity inversion using stationary seafloor instruments**
Andrei Swidinsky, PhD Student, University of Toronto, Canada

1040 **Poster highlights: 10 x 2 minute poster overviews**

1100 *Coffee (Time to meet with poster presenters and exhibiting organizations)*

13: Detection Classification and Localisation Algorithms and Techniques

Chair **Dr John Holmes**, Senior Scientist, Naval Surface Warfare Center, USA

1140 **Target recognition of ships based on frequency-diversity and ICA techniques**
Professor Kun-Chou Lee, Professor, National Cheng-Kung University, Taiwan

1205 **CSEM and MMT signal recovery in time intervals corrupted with short duration spikes**
Vidar Markhus, Senior Scientist, EMGS, Norway

1230 **Target Detection with extremely low frequency magnetic anomaly detection signal**
Dr Marius Birsan, Defence Scientist, Defence R&D Canada, Canada

1255 *Lunch (Time to meet with poster presenters and exhibiting organizations)*

14: Reservoir Modelling

Chair **Dr Lucy MacGregor**, Chief Technology Officer, OHM-Rock Solid Images, UK

1400 **Resolution of reservoir scale electrical anisotropy from marine CSEM data**
Vanessa Brown, Student, Institute de Physique du Globe de Paris, France

1425 **Reservoir monitoring using EM measurement from a vertical transmitter-receiver setup**
Jon Mattis Børven, Geophysicist, Petromarker, Norway

1450 **3D Inversion of time-lapse CSEM data for reservoir surveillance**
Dr Noel Black, Geophysicist, TechnoImaging, USA

1515 **Marine controlled source electromagnetics for hydrocarbon field monitoring**
Dr Jurgen Zach, Senior Scientist, EMGS Americas, USA



2011 MARELEC POSTER PROGRAM PRESENTATIONS

MONDAY JUNE 20, 2011

1.1	Inverse problem method for reconstruction technique of multiple layered ship magnetic signatures	Kwan-Seob Yoon, Research Engineer LIG NEX1 Co. Ltd, South Korea
1.2	Electromagnetic rapid environmental assessment in a structured sediment environment	Lisa Rosenqvist, Scientist Swedish Defence Research Agency FOI, Sweden
1.3	Development of FE methods for CSEM problems and their application to massively parallel computers	Jelena Koldan, Student Barcelona Supercomputing Center, Spain
1.4	Three-dimensional inversion of controlled-source electromagnetic data using ModEM	Chatchai Vachiratienchai, Student Mahidol University, Thailand
1.5	Exploiting active source electromagnetic fields for characterization of underwater ordnance	Gregory Schultz, Research Geophysicist Sky Research Inc., USA
1.6	Performance assessment of the matched filter-based magnetic anomaly detection	Steeve Zozor, CNRS Researcher GIPSA-Lab, France
1.7	Implementation of an underwater image classifier using neural network	Supriya MH, Reader Cochin University of Science and Technology, India
1.8	Understanding low frequency EMI sensing phenomena for underwater UXO targets detection and classification	Fridon Shubitidze, Assistant Research Professor Dartmouth College, USA
1.9	Calculate electromagnetic fields in stratified medium with layer-matrix method	Changmin Fu, Engineer - Institute of Geology and Geophysics, Chinese Academy of Sciences, China
1.10	Natural source electromagnetic survey around Japan Trench using small ocean bottom electro-magnetometer system	Hiroshi Ichihara, Researcher Japan Agency for Marine-Earth Science & Technology, Japan

TUESDAY JUNE 21, 2011

2.1	The mirror effect, a noise reduction technique in aeromagnetic survey	Olivier Ayotte, President Geosphair Aviation Inc., Canada
2.2	Calibrating amplified induction-coil magnetometers	Brent Wheelock, Graduate Student Scripps Institution of Oceanography, USA
2.3	All solid-state marine electric field sensor evaluation	Song Huang, Postdoctoral - Institute of Geology and Geophysics, Chinese Academy of Sciences, China
2.4	Simulator of magnetometer and gradiometer to evaluate detection and classification algorithms	Yann Yvinec, Researcher Royal Military Academy, Belgium
2.5	NERIDIS III – A controlled-source electromagnetic profiler for marine environmental research	Benjamin Baasch, PhD-Student Marine Geophysics University of Bremen, Germany
2.6	An electric field sensor built upon a coupled nonlinear oscillator	Andy Kho, Electrical Engineer SPAWAR Systems Center Pacific, USA
2.7	Micro Orthogonal fluxgate sensor fabricated with a Co-based amorphous wire	Kwang-Ho Shin, Professor Kyungshung University, South Korea
2.8	The development of a low cost multi-use electromagnetic signature measurement range	James Kelly, Technical Leader Atlas Elektronik, UK
2.9	A study of Preisach model for developing demagnetization technique by using M-B variables	Gwan Soo Park, Professor Pusan National University, South Korea

WEDNESDAY JUNE 22, 2011

3.1	Maritime sensors network for magnetic detection – Preliminary test	Boris Ginzburg , Senior Researcher NRC SOREQ, Israel
3.2	A comparison of time-domain and frequency-domain CSEM: Insights from modeling	Dylan Connell , Graduate Student Scripps Institution of Oceanography, USA
3.3	Experiment of the electric field measurement in the bottom of Bohai sea, North China	Ya Xu , Associate Professor - Institute of Geology and Geophysics, Chinese Academy of Sciences
3.4	Full tensor SQUID gradiometer for marine applications	Andreas Chwala , Research Scientist Institute of Photonic Technology, Germany
3.5	Nearshore electromagnetic profiling for high resolution sediment lithology	Jean-Francois D'Eu , Research Engineer Universite de Brest, France
3.6	Development of archival tags for studying the migratory routes of marine species	John Prajas , Doctoral Researcher Cochin University of Science and Technology, India
3.7	Monitoring and analysis of the marine underwater electric field off the south coast of Dalian	Lu Junjun , Deputy Director Dalian Scientific Test & Control Technology Institute, China
3.8	Experimental verification on separation of permanent and induced magnetic field of model vessel using inter- cardinal run	Hyang-Beom Lee , Professor Soongsil University, South Korea
3.9	Separation of noise sources in the ocean using independent component analysis	Supriya MH , Reader Cochin University of Science and Technology, India

THURSDAY JUNE 23, 2011

4.1	An overview of the electromagnetic experiments on CFAV QUEST during RIMPASSE 2011	Brad Nelson , Defence Scientist Defence Research & Development Atlantic, Canada
4.2	Magnetic shielding caused by the ship hull at extremely low frequencies	Marius Birsan , Defence Scientist Defence Research & Development Atlantic, Canada
4.3	Numerical simulation of UEP signatures with propeller-induced ULF modulations in maritime ICCP systems	David Schaefer , Ph.D. Student University of Duisburg-Essen, Germany
4.4	Eddy current contribution to magnetic fields of permeable conducting objects	Reinier Tan , Scientist TNO, The Netherlands
4.5	Magnetic noise level measurements on 'survey class' ROVs	Tim Fristedt , Senior Scientist Swedish Defence Research Agency FOI, Sweden
4.6	A coupled finite and boundary element model for the shielding of alternating EM Fields	James Ashton , Scientist Atlas Elektronik, UK
4.7	Closed loop degaussing system, major issue solved through DCNS/G2ELAB collaboration	Laurent Demilier , Electromagnetic Silencing Engineer DCNS, France

Program correct as at June 2, 2011

Each presenting author will also have the opportunity to make a short presentation on their poster within the main conference programme