

SP-613
April 2006

Proceedings of SEASAR 2006

**Advances in SAR Oceanography
from Envisat and ERS Missions**

23 – 26 January 2006
Frascati, Italy

**European Space Agency
Agence spatiale européenne**

SCIENTIFIC COMMITTEE

G.A. Athanassoulis (National Technical University of Athens, Greece)
B. Chapron (IFREMER, France)
P. Clemente-Colón (NOAA/NESDIS, USA)
J. Da Silva (University of Lisboa, Portugal)
M. Xia He (Ocean University of China, China)
J. Horstmann (GKSS, Germany)
J. Schulz-Stellenfleth (Germany Aerospace Center, Germany)
J.A. Johannessen (NERSC, Norway)
H. Johnsen, (NORUT, Norway)
G. Kallos (IASA-University of Athens, Athens)
V. Kerbaol (BOOST Technologies, France)
M. Junmin (FIO, China)
I. Robinson (Southampton Oceanography Centre, England)
D.R. Thompson (JHU-APL, USA)
P.W. Vachon (Defence R&D Canada, Canada)
C.C. Wackerman (Veridian Systems, USA)
J. Antonio Lorenzzetti (INPE, Brazil)
B. Holt (NASA, USA)
S. Lehner (DLR, Germany)
W. Alpers (University of Hamburg, Germany)

ORGANISING COMMITTEE

Y.-L. Desnos (ESA)
B. Rosich-Tell (ESA)
M. Engdahl (ESA)
M. Drinkwater (ESA)
E. Attema (ESA)

Cover image:

Doppler-derived radial surface velocity (m/s) off the Florida strait based on an ASAR image 5 July 2005.
The radial direction is mostly toward the east, northing about 10 degrees.

(Credit: BOOST Technologies)

Publication: Proceedings of SEASAR 2006, 23-26 January 2006, Frascati, Italy,
(ESA SP-613, April 2006)

Editor: H. Lacoste
Compiled by: L. Ouwehand

Published and distributed by: ESA Publications Division
ESTEC
Postbus 299
2200 AG Noordwijk
The Netherlands

Printed in: The Netherlands

Price: 40 Euros

ISBN No: 92-9092-924-3

ISSN No: 1609-042X

Copyright: © 2006 European Space Agency

Contents

Foreword

Y.-L. Desnos

Wave Mode Algorithms, Validation and Assimilation

Envisat ASAR Wave Mode Products - Quality Assessment and Algorithm Upgrade

H. Johnsen, G. Engen, F. Collard et al.

Statistical Analysis of a Two Year Global Dataset of Re-Processed ERS-2 Imagettes over the Global Oceans

S. Lehner, S.T. König and J. Schulz-Stellenfleth

Assimilation of Envisat Altimeter and Scatterometer Data in Real Time Wave Predictions

G. Kallos, G. Galanis & G. Emmanouil

Retrieval of Integral Ocean Wave Parameters from SAR Data Using an Empirical Approach

J. Schulz-Stellenfleth, T. König & S. Lehner

Why SAR Wave Mode Data of ERS and Envisat are Inadequate for Giving the Probability of Occurrence of Freak Waves

P. Janssen & W. Alpers

The Impact of Using the Upgrade Processing of ASAR Level 2 Wave Products in the Assimilation System

L. Aouf, J.-M. Lefèvre, D. Hauser et al.

Global Validation and Assimilation of Envisat ASAR Wave Mode Spectra

S. Abdalla, J.-R. Bidlot & P. Janssen

Comparison of Envisat ASAR Ocean Wave Spectra with Buoys and Altimeter Observations via a Wave Model

J.-G. Li & M. Holt

Ocean Current Applications

The Benefits of Combining Coupled Wave-Current Models with SAR Observations for the Interpretation of Ocean-Surface Currents

T. Macklin, J. Wolf, S. Wakelin et al.

Ocean Surface Drift by Wavelet Tracking Using ERS-2 and Envisat SAR Images

A.K. Liu, Y. Zhao & M.-K. Hsu

Backscatter and Doppler Signals of Surface Current in SAR Images: A Step Towards Inverse Modelling

J.A. Johannessen, V. Kudryavtsev, B. Chapron et al.

Observations of Oceanic Internal Waves in Bay of Bengal Using Synthetic Aperture Radar

K.V.S.R Prasad & M. Rajasekhar

Ocean Wind Applications

Ship Detection on Envisat ASAR Data: Validation of Parametric Hurricane Models by Envisat ASAR Images

S. Lehner, A. Reppucci & J. Schulz-Stellenfleth

Observation of Hurricane Winds Using Synthetic Aperture Radar

J. Horstmann, W. Koch, D.R. Thompson & H.C. Graber

On Determination of Wind Vectors for C-band SAR

W. Perrie, Y. He & H. Shen

Rain Cells Associated with Atmospheric Fronts over the Ocean Studied by Spaceborne SAR and Weather Radar Data

W. Alpers & I.I. Lin

Wave Applications

A Parametric Inversion Scheme for the SAR Retrieval of 2-D Ocean Wave Spectra

J. Schulz-Stellenfleth & S. Lehner

Analysis of SAR Wave Mode Imagette Taken under Extreme Wind and Wave Conditions

A. Reppucci, J. Schulz-Stellenfleth, S. Lehner & T. König

Bullet Train of Non-Linear Internal Waves from Luzon Strait

C.-T. Liu, R. Pinkel, M.-K. Hsu et al.

Oil Spill and Ship Detection

FEXP Models for Oil Slick and Low-Wind Areas Analysis and Discrimination in Sea SAR Images

M. Bertacca, F. Berizzi & E. Dalle Mese

Oil Spill Observation by Means of Polarimetric SAR Data

M. Migliaccio, A. Gambardella & M. Tranfaglia

Neural Networks for Oil Spill Detection Using ERS and Envisat Imagery

E. Angiuli, F. Del Frate & L. Salvatori

Bayesian Adaptive Oil Spill Segmentation of SAR Images via Graph Cuts

S. Pelizzari, J.M. Bioucas Dias

Findings of the DECLIMS project - Detection and Classification of Marine Traffic from Space

H. Greidanus & N. Kourti

Ship Detection on Envisat ASAR Data: Results, Limitations and Perspectives
G. Hajduch, P. Leilde & V. Kerbaol

Tri-Dimensional Vessel Classification Patterns Inferred via Single-Pass Polarimetric SAR Interferometry
G. Margarit, J.J. Mallorqui & X. Fabregas

A Novel Algorithm for Automatic Ship and Oil Spill Detection Based on Time-Frequency Methods
M. Tello, C. López-Martínez & J.J. Mallorqui.

Methodology and Techniques

Potential Investigation of SAR Data In Monitoring Island and its Surrounding Environment: 8-Year Dynamic Monitoring of South Five-Island in Miaodao Archipelago of China
X. Wang & J. Zhang

Ice Applications

The Role of Near Real Time Envisat ASAR Global Monitoring Mode Data in Arctic and Antarctic Operational Ice Services
N. Walker, T. Street, T. Skagemo-Andreassen et al.

Inferring the Degree of Ice Field Deformation in the Baltic Sea Using Envisat ASAR Images
M. Similä, J. Karvonen & C. Haas

Poster Session

Advances on Wind Energy Resource Mapping from SAR
C.B. Hasager, M. Nielsen, M.B. Christiansen et al.

Correlation Analysis of Underwater Bottom Topography and its SAR Images
J. Yang, J. Zhang & J. Meng

Synthetic Aperture Radar for Offshore Wind Resource Assessment and Wind Farm Development in the UK
I. Cameron, P. Lumsdon, N. Walker & I. Woodhouse

Numerical Pseudo-Random Simulation of SAR Sea and Wind Response
E. Pugliese Carratelli, F. Dentale & F. Reale

Wave Dispersion by Antarctic Pancake Ice From Sar Images: A Method for Measuring Ice Thickness
P. Wadhams, F. Parmiggiani & G. de Carolis

Synergy Envisat ASAR, ERS-2 SAR, RADARSAT SAR, Landsat TM and MODIS Images to Research Propagation Features of Internal Solitary Waves in Northern of South China Sea
J. Meng & J. Zhang

Study on Evolutions of Jiangsu Radiating Sandbanks Based on SAR Images
Y. Song & J. Zhang

SAR monitoring of Sea Ice Evolution in Main China Offshore Sea Ice Regions
Y. Ji, J. Zhang & J. Meng

The K-Generalized Model to Characterize Marine Features in SAR Images: First Results
M. Migliaccio, G. Ferrara, A. Gambardella & D. Aiello

Monitoring Atmospheric Gravity Waves by Means of SAR, MODIS Imagery and High-Resolution ETA Atmospheric Model: A Case Study
M. Adamo, G. De Carolis, S. Morelli & F. Parmiggiani

Supervised Pattern Classification Techniques for Oil Spill Classification in SAR Images: Preliminary Results
A. Montali, G. Giacinto, M. Migliaccio & A. Gambardella

Observation of Rip Currents by Synthetic Aperture Radar
J.C.B. da Silva, F. Sancho & L. Quaresma

List of Participants

Group Photo