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An interdisciplinary view of the ocean

Edited by J.L. Pelegrí, I. Alonso and J. Arístegui

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An interdisciplinary view of the ocean

RESEARCH ARTICLES

The ocean, our climate and the earth's health

J.L. Pelegrí, I. Alonso and J. Arístegui

Sci. Mar. 65(Suppl.1): 3-6

**Aeolian sediment availability in coastal areas defined from sedimentary parameters.
Application to a case study in Fuerteventura**

J. Alcántara-Carrió and I. Alonso

Sci. Mar. 65(Suppl.1): 7-20

Flank stability and processes off the western Canary Islands: a review from El Hierro and La Palma

Roger Urgeles, Miquel Canals and D.G. Masson

Sci. Mar. 65(Suppl.1): 21-32

Determination of metallic complexing capacities of the dissolved organic material in seawater

Luis M. Laglera-Baquer, M. González-Dávila and J.M. Santana-Casiano

Sci. Mar. 65(Suppl.1): 33-40

Carbon dioxide system in the Canary region during October 1995

J. Magdalena Santana-Casiano, M. González-Dávila, L.M. Laglera Baquer and M.J. Rodríguez Somoza

Sci. Mar. 65(Suppl.1): 41-50

The seasonal planktonic cycle in coastal waters of the Canary Islands

Javier Arístegui, Santiago Hernández-León, María F. Montero and May Gómez

Sci. Mar. 65(Suppl.1): 51-58

Zooplankton abundance in subtropical waters: is there a lunar cycle?

Santiago Hernández-León, C. Almeida, L. Yebra, J. Arístegui, M.L. Fernández de Puelles and J. García-Braun

Sci. Mar. 65(Suppl.1): 59-64

Succession of phytoplankton assemblages in relation to estuarine hydrodynamics in the Ría de Vigo: a box-model approach

Belén Martín Miguez, L. Fariña-Busto, F.G. Figueiras and F.F. Pérez

Sci. Mar. 65(Suppl.1): 65-76

Advection of continental water as an export mechanism for anchovy, *Engraulis encrasicolus*, larvae

Ana Sabatés, Jordi Salat and M. Pilar Olivar

Sci. Mar. 65(Suppl.1): 77-88

Chlorophyll increase due to internal waves in the shelf-break of Gran Canaria Island (Canary Islands)

Pablo Sangrà, G. Basterretxea, J.L. Pelegrí and J. Arístegui

Sci. Mar. 65(Suppl.1): 89-97

Larval trophodynamics, turbulence, and drift on Georges Bank: A sensitivity analysis of Cod and Haddock

Francisco Werner, B.R. MacKenzie, R.I. Perry, R.G. Lough, C.E. Naimie, B.O. Blanton and J.A. Quinlan

Sci. Mar. 65(Suppl.1): 99-115

Experiments on layer formation in stratified shear flow

Jesús Cisneros-Aguirre, J.L. Pelegrí and P. Sangrà

Sci. Mar. 65(Suppl.1): 117-126

Methodology to obtain accurate sea surface temperature from locally received NOAA-14 data in the Canary-Azores-Gibraltar area

Francisco Eugenio, J. Marcello, A. Hernández-Guerra and E. Rovaris

Sci. Mar. 65(Suppl.1): 127-137

Field validation of a semi-spherical Lagrangian drifter

M. Gasser, J. Salvador, P. Sangrà and J.L. Pelegrí

Sci. Mar. 65(Suppl.1): 139-143

Nivmar: a storm surge forecasting system for Spanish waters

Enrique Álvarez Fanjul, Begoña Pérez Gómez and Ignacio Rodríguez Sánchez Arévalo

Sci. Mar. 65(Suppl.1): 145-154

Tidal currents and mixing in the Lake Maracaibo estuarine system

Ana Antoranz, J.L. Pelegrí and P. Masciangioli

Sci. Mar. 65(Suppl.1): 155-166

Mesoscale structures viewed by SAR and AVHRR near the Canary islands

E.D. Barton, P. Flament, H. Dodds and E.G. Mitchelson-Jacob

Sci. Mar. 65(Suppl.1): 167-175

Water masses, circulation and transport in the eastern boundary current of the North Atlantic subtropical gyre

Alonso Hernández-Guerra, Federico López-Laatzén, Francisco Machín, Demetrio de Armas and J. L. Pelegrí

Sci. Mar. 65(Suppl.1): 177-186

Sensitivity of an idealized subtropical gyre to the eastern boundary conditions

Irene Láiz, P. Sangrà, J.L. Pelegrí and A. Marrero-Díaz

Sci. Mar. 65(Suppl.1): 187-194

Applicability of T-S algorithms to the Canary Islands region

Ángeles Marrero-Díaz, J.L. Pelegrí, A. Rodríguez-Santana and P. Sangrà

Sci. Mar. 65(Suppl.1): 195-204

Seasonal and interannual variability of the Canary Current

E. Navarro-Pérez and E.D. Barton

Sci. Mar. 65(Suppl.1): 205-213

On the homogeneity of the wave field in coastal areas as determined from ERS-2 and RADARSAT synthetic aperture radar images of the ocean surface

F. Ocampo-Torres

Sci. Mar. 65(Suppl.1): 215-228

Short-time scale coupling between thermohaline and meteorological forcing in the Ría de Pontevedra

P.C. Pardo, Miguel Gilcoto and Fiz F. Pérez

Sci. Mar. 65(Suppl.1): 229-240

Dynamical characteristics of the Cape Verde frontal zone

Pilar Pérez-Rodríguez, J.L. Pelegrí and A. Marrero-Díaz

Sci. Mar. 65(Suppl.1): 241-250

Seasonal variability of the upper warmwatersphere in the Canary Basin

Andry W. Ratsimandresy, J.L. Pelegrí, A. Marrero-Díaz, A. Hernández-Guerra and A. Martínez

Sci. Mar. 65(Suppl.1): 251-258

On the relevance of diapycnal mixing for the stability of frontal meanders

Ángel Rodríguez-Santana, J.L. Pelegrí, P. Sangrà and A. Marrero-Díaz

Sci. Mar. 65(Suppl.1): 259-267

Wind and tide current prediction using a 3D finite difference model in the Ría de Vigo (NW Spain)

Carlos Souto, L. Fariña-Busto, E. Alvarez and I. Rodríguez

Sci. Mar. 65(Suppl.1): 269-276

Residual circulation and thermohaline distribution of the Ría de Vigo: A 3-D hydrodynamical model

Silvia Torres López, R.A. Varela and E. Delhez

Sci. Mar. 65(Suppl.1): 277-289

Vertical velocities at an ocean front

Pedro Vélez-Belchí and Joaquín Tintoré

Sci. Mar. 65(Suppl.1): 291-300

INDEX

Index

J.L. Pelegrí, I. Alonso and J. Arístegui

Sci. Mar. 65(Suppl.1): 301-304




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On the homogeneity of the wave field in coastal areas as determined from ERS-2 and RADARSAT synthetic aperture radar images of the ocean surface

F. Ocampo-Torres

Spatial variations of the wave field in coastal waters were determined from images obtained by synthetic aperture radar (SAR) on board the European satellites ERS-1 and 2. The capabilities of RADARSAT SAR to provide useful information for evaluating the wave field variation in nearshore waters are explored. Besides the different polarization between ERS and RADARSAT SARs, range to velocity ratios, signal to noise ratios and the acquisition swath are important issues to take into consideration in comparing the performance of the radar systems. In situ data from a coastal region in the north-west of Baja California are used to validate some of the remote observations and to provide relevant ground truth. Particular aspects of wave phenomena in finite depth waters such as refraction, diffraction and groupiness are considered. An appropriate method for analysing the radar images is applied to describe wave features as they originate from a non-homogeneous process. Wave field characteristics and their spatial variations as resolved by RADARSAT SAR are relevant variables for applications such as beach erosion and coastal management. Inclusion of specific modules to retrieve this type of information should be considered for operational software packages for the use and application of ocean surface data from SAR images. The differences of the two radar systems did not affect their capabilities to observe the wave field in coastal regions.

 Sci. Mar. 65(Suppl.1): 215-228



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