Geophysical Research Abstracts
Vol. 14, EGU2012-10284, 2012
EGU General Assembly 2012


# SWAN wave simulations in the Southern Thyrrenian Sea with COSMO SKY-MED SAR data

G. Benassai (1), M. Migliaccio (2), A. Montuori (2), and A. Ricchi (1)

(1) Dipartimento di Scienze Applicate (DSA), Università degli Studi di Napoli Parthenope, Napoli, Italy (gbenassai@iol.it), (2) Dipartimento per le Tecnologie (DiT), Università degli Studi di Napoli Parthenope, Napoli, Italy (antonio.montuori@uniparthenope.it)

In this study the use of SAR-derived wind fields is proposed to force surface wave models in a coastal environment, together with their validation with a valuable data sets provided by both scatterometer and wave buoys data. The test area is the coastal zone of the Southern Tyrrhenian Sea, including the gulfs of Gaeta, Napoli, Salerno and Policastro, which is of great applicative relevance for both oceanographic and coastal-maritime surveillance purposes. The study can be summarized according to the three following stages. The first one consists of preliminary simulations of the wave fields, accomplished by means of both Wave Watch III (WWIII) and Weather Research and Forecasting (WRS) models, respectively, with forcing provided by ECMWF wind field model data. Once the relevant wave parameters have been evaluated on the calculation grid (i.e. significant wave height, Hs, wave direction, Dw, and peak period, Tp), the wave model validation is performed with respect to some significant wave storms relevant to the summer and the winter seasons of 2010. The second stage of the study concerns the verification of the wave model numerical simulations with forcing provided by SAR-derived wind field estimations. Within such a framework, X-band Level 1B Detected Ground Multi-look (DGM) ScanSAR Huge Region mode VV-polarized COSMO-SkyMed© SAR measurements are processed for both wind speed and wind direction estimation purposes. In detail, the wind speed is estimated through the SAR-based azimuth cut-off procedure, while the wind direction is retrieved through the Multi-Resolution Analysis of Wavelet Transform. A validation step is accomplished to compare relevant wave parameters gathered by means of SAR-derived wind field estimations with those ones provided by both ASCAT scatterometer wind data and in situ observations. Finally, the third stage of the study is about the development of some techniques to improve the model accuracy, in particular the use of blended data, i.e. ECMWF model data and COSMO-SkyMed© SAR-derived wind field retrievals.