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On the assessment of re-assimilation of ASAR Wave Spectra in the ERA-Interim Reanalysis

Isabel Bué (1,2,4), Alvaro Semedo (1,2), Lotfi Aouf (3), and João Catalão (2)

(1) Escola Naval - CINAV, Lisbon, Portugal , (2) Instituto Dom Luiz, Faculdade de Ciências, University of Lisbon, Portugal, (3) Division of Marine and Oceanography, Météo-France, Toulouse, France, (4) Corresponding author: Escola Naval - CINAV, Lisbon, Portugal (isabel.maria.bue@marinha.pt)

The Sentinel-1A satellite, launched on April 3 2014, is the first of the new European Spatial Agency (ESA) missions developed for the Copernicus initiative. The European Earth observations program Copernicus will offer vital environmental information for the global monitoring of climate, for meteorological forecast, as well as for new security aspects concerning environment catastrophes. The Sentinel-1 platform will ensure the continuity of global wave spectra measurements from space, already available since 1991 with ERS-1, ERS-2 and ENVISAT/ASAR, thanks to one mode of acquisition that is dedicated to swell measurements in open ocean, the wave mode. This satellite constellation comprises two polar orbiting satellites, operating in a tandem mode, with the second (the Sentinel 1B), sharing the same orbital plane with a 180° orbital phasing difference, being launched during 2016. The satellites will perform as a C-band ASAR imagers and will operate day and night, regardless of the weather.

In this study significant wave height (SWH) comparisons between wave altimetry measurements from ERS-2 and ENVISAT and several wave buoy measurements in the North Atlantic, and the ECMWF (European Centre for Medium-Range Weather Forecasts) ERA-Interim reanalysis, are presented trough the triple-collocation method. The triple collocation method is needed to use all the different data (due to the different acquisitions, resolutions, time and space positioning), having the buoy positions as the key element for the positioning of all measurements. The triple collocated data will then be compared with SWH computed from the wave spectra retrievals from the ENVISAT ASAR wave mode. After that the ERA-Interim wave spectra is statistically corrected with the ENVISAT measured spectra, with an evaluation of the gains of this process.