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High resolution wave model validation over the Greek maritime areas

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The increasing maritime activity can be seriously affected by severe weather and sea conditions. To avoid serious damages to ships, marine structures and humans, a good weather and wave forecast is of primary importance. In general combined meteorological and the wave models are used to produce forecasts both at large scale and at medium-size inner seas. For much smaller environments like the Greek maritime areas, characterized by complicated features like the orography and the presence of numerous islands, the wave modeling is not a simple task.

This study is devoted to the validation of the performance of the WAM wave model over the Ionian and Aegean Seas. The period of validation refers to the first 12-months of operational use of the model at the National Observatory of Athens. The wave model is applied at a resolution of 1/16 degrees and is driven by the 10 m wind, produced by the BOLAM meteorological model operationally run over the same area. Two different sources of data have been used for the verification of the model results. The first data set is provided by a network of buoys deployed over the Greek maritime areas and the second consists of altimeter data, provided by the OSTM/Jason 2 satellite platform. Although the study area is characterized by complex topography and a large number of islands, the implementation of the WAM model provides very encouraging results. In general, with the exception of the two buoys located in the Ionian Sea, the WAM model tends to underestimate the wave energy in the region of the Aegean Sea. The comparison with the altimeter data over the Greek seas, shows that the model has a tendency to overestimate the height for waves lower than 2.5 m and to underestimate the waves higher than 3 m.