

# **Evaluation of WAVEWATCH III for Wave Modelling in the Persian Gulf**

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## **Abstract**

Wind waves are one of the most substantial marine hydrodynamics phenomena and its prediction is of great importance. Nowadays, numerical models such as WAVEWATCH III (WW III) are comprehensively used for modelling and predicting deep water waves. Different methods have been included in WW III for modelling of the wind-sea interaction and wave dissipation in deep water. Using each of these methods in wave modelling led to partly various results. In this research, the capability of WW III model has been evaluated in simulation of wind induced waves in Persian Gulf. For that, wave field measurement data has been firstly collected. The collected field data are related to deep water wave measurements in Lavan and Farour (2009-2010), Boushehr (2005) and Farzad A Platform (2013). Then, Persian Gulf waves at specified time domains were modeled using some existing parameterization in model including Tolman and Chalikov, BAJ, ACC350 and WAM4. To do so, ECMWF or NOAA wind data has been used depending on modelling time period. Hereafter, simulated significant wave height, peak spectral period and wave direction based on different parameterizations were compared with measured values in each stations. Obtained results indicated that ACC350 parameterization seriously overestimate the wave height in all stations and most of times especially in storm conditions. Other parameterizations normally underestimate that. Results indicated that WAM4 is most reasonable parameterization for wave height while ACC350 outperforms other methods in peak spectral simulations. Furthermore, all of the parameterizations predicted approximately similar values for wave direction.

## **Keywords:**

Wave hydrodynamics, Wave forecasting, Field data, Numerical simulation, ACC350, WAM4, BAJ