Near Shore Wave Modeling and applications to wave energy estimation

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The estimation of the wave energy potential at the European coastline is receiving increased attention the last years as a result of the adaptation of novel policies in the energy market, the concernsfor global warming and the nuclear energy security problems. Within this framework, numerical wave modeling systems keep a primary role in the accurate description of wave climate and microclimate that is a prerequisite for any wave energy assessment study.

In the present work two of the most popular wave models are used for the estimation of the wave parameters at the coastline of Cyprus: The latest parallel version of the wave model WAM (ECMWF version), which employs new parameterization of shallow water effects, and the SWAN model, classically used for near shore wave simulations. The results obtained from the wave models near shores are studied by an energy estimation point of view: The wave parameters that mainly affect the energy temporal and spatial distribution, that is the significant wave height and the mean wave period, are statistically analyzed,focusing onpossible different aspects captured by the two models. Moreover, the wave spectrum distribution prevailing in different areas are discussed contributing, in this way, to the wave energy assessmentin the area.

This work is a part of two European projects focusing on the estimation of the wave energy distribution around Europe: The MARINA platform (http://www.marina-platform.info/ index.aspx) and the Ewave (http://www.oceanography.ucy.ac.cy/ewave/) projects.