



The sea surface currents as a potential factor in the estimation and monitoring of wave energy potential

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The use of wave energy as an alternative renewable is receiving attention the last years under the shadow of the economic crisis in Europe and in the light of the promising corresponding potential especially for countries with extended coastline. Monitoring and studying the corresponding resources is further supported by a number of critical advantages of wave energy compared to other renewable forms, like the reduced variability and the easier adaptation to the general grid, especially when is jointly approached with wind power. Within the framework, a number of countries worldwide have launched research and development projects and a significant number of corresponding studies have been presented the last decades. However, in most of them the impact of wave-sea surface currents interaction on the wave energy potential has not been taken into account neglecting in this way a factor of potential importance.

The present work aims at filling this gap for a sea area with increased scientific and economic interest, the Eastern Mediterranean Sea. Based on a combination of high resolution numerical modeling approach with advanced statistical tools, a detailed analysis is proposed for the quantification of the impact of sea surface currents, which produced from downscaling the MyOcean-FO regional data, to wave energy potential. The results although spatially sensitive, as expected, prove beyond any doubt that the wave-sea surface currents interaction should be taken into account for similar resource analysis and site selection approaches since the percentage of impact to the available wave power may reach or even exceed 20% at selected areas.