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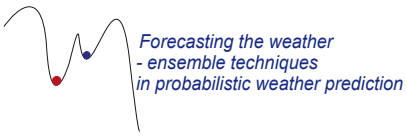

Analysis of wind potential and wind extremes in the framework of the MARINA-PLATFORM project.

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The objective of the MARINA-PLATFORM project is to establish a set of equitable and transparent criteria for the evaluation of multi-purpose platforms for marine renewable energy, all focused on system integration and cost reduction. One way of reducing costs is to exploit synergies with other technologies. One effective choice is to combine off-shore wind with other marine renewable energy technologies; primarily wave energy, but also ocean and/or tidal currents at sites where these resources are concentrated. MARINA-PLATFORM is primarily a research project focused on the longer-term benefits and synergies of integrating deep-water wind and ocean energy.
Within the aims of the MARINA-PLATFORM project is to map the off-shore wind, wave, tidal and sea-current energy resources in the North Atlantic and the Mediterranean sea. The Atmospheric Modelling & Weather Forecasting Group at the University of Athens working closely with the Ocean Physics & Modelling Group, are performing long-term, high-resolution and state-of-the-art model simulations in order to provide the required data (hourly fields that cover a period of 10 years with a spatial resolution of about 5 Km). For these simulations the latest versions of the regional atmospheric model SKIRON and the wave model WAM are used. Advanced assimilation techniques and remote sensing data are combined with the operational analyses from ECMWF.
One of the main components of this work is to utilise these model data and develop a combined wind—wave—tidal—current resource atlas including a statistical analysis of extreme events, which is needed for the suitable platform designs, as well as a set of uni- and multi-parametric statistics for a number of selected locations. Apart from this statistical analysis of wind and wave power we shall perform a validation study of the SKIRON model results against wind measurements and wind power outputs recorded at selected off-shore platforms with wind generators fitted. Statistical techniques will be applied (e.g. implementing a Kalman filter) in order to enhance the forecast skill by eliminating possible systematic errors in the model output. Combining the model output with such statistical methods has already been tested at a number of wind farms in Greece and it has given very good results.