Geophysical Research Abstracts
Vol. 21, EGU2019-13114, 2019
EGU General Assembly 2019

Fostering Marine Energy Exploitation in the Mediterranean Region: the PELAGOS project experience

Gianmaria Sannino, Andrea Bargagli, Adriana Carillo, Roberto Iacono, Ernesto Napolitano, Giovanna Pisacane, and Maria Vittoria Struglia

ENEA, SSPT-MET-CLIM, Rome, Italy (gianmaria.sannino@enea.it)

Marine Energy (ME) exploitation in the Mediterranean Sea has received growing attention in the last years.
New technologies for the conversion of ME into electricity, tailored for the Mediterranean environment, are now ready for full-scale deployment, opening up new perspectives for sustainable energy production, especially in coastal areas and small islands.
The disclosure of this opportunity poses at the same time new technological, economical and environmental challenges.
In the framework of the transnational European Cooperation Programme for the Mediterranean area (Interreg MED Programme 2014-2020), the PELAGOS project (Promoting innovative nEtworks and cLusters for mArine renewable energy synerGies in mediterranean cOasts and iSlands) aims to facilitate the deployment of targeted technological solutions and products that are tailored to the characteristics of the Mediterranean environment. The achievement of such a goal is pursued by the creation of transnational clusters of specialized suppliers and research institutes that can provide tailor-made technological solutions for both the improvement of devices and adequate environmental monitoring.
The project has been structured in order to encompass all the relevant aspects involved: the review of available technologies, the assessment of the resources, the impact on the marine environment, the competition with other productive activities.
We will describe the objectives, the methodology and the results achieved in the first two years of the project implementation.
Among all the different contribution given by the authors to the PELAGOS project, there is also an active role to the technological cluster activities.
Numerical modelling of both ocean circulation and waves is of particular importance for the assessment of the available resources as well as for the operational set-up of the devices.
The MET-CLIM Lab has developed a very high-resolution forecasting model of the circulation of the Mediterranean Sea-Black Sea system (MIT Operational -MITO), which includes the effects of the four main astronomical tides. The model has 100 vertical levels, while the horizontal grid has a uniform resolution of 1/48° (about 2km) over most of the domain, except in three regions where higher resolution is implemented to correctly resolve local dynamics: the Strait of Gibraltar, where the grid is locally stretched reaching a maximum resolution of 1/800° (about 120 m), the Dardanelles and the Bosphorus, where the resolution smoothly increases in the latitudinal and longitudinal directions, allowing for a maximum resolution of 1/250° (about 380 m).
The model is forced at the surface by hourly wind stress and heat and fresh water fluxes derived from the high-resolution (5 km), non-hydrostatic SKIRON/ Eta regional atmospheric modelling system of the National and Kapodistrian University of Athens and is driven at the lateral open boundary by the tracer and velocity fields provided by the NEMO operational model (hourly data).
In particular, MITO, as a high resolution circulation model including tides, can be used to force higher resolution circulation models necessary to the assessment of the resource at local scale.
We will show preliminary results of the simulations of Mediterranean and Black Sea circulation performed.