

## **SEMINARIO DEL GIOVEDÌ' CETEMPS**

**"A high resolution coupled ocean-atmosphere forecast of the Adriatic Sea: preliminary results of test cases using ROMS+SWAN+WR "**

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**Aula «Signorelli», Edificio Renato Ricamo, Coppito 1,  
Università degli Studi dell'Aquila, Via Vetoio, L'Aquila**  
*(<http://cetemps.aquila.infn.it/evento/alessandro-coluccelli>)*

### **ABSTRACT**

The role of Sea Surface Temperature in the weather forecast has been investigated in the past years and its role in modulating local circulation has been assessed. Therefore, in this context a coupled system ocean-atmosphere has been developed in a cooperation between DiSVA, Università Politecnica delle Marche and CETEMPS, University of L'Aquila. The coupled models ROMS, SWAN and WRF run operationally at high resolution for the Adriatic Sea. For what concerns the atmospheric component the WRF-ARW model is used. Two domains run independently: a low resolution domain (15 km) initialized using NCEP analyses at 0.25 degrees and a high resolution domain (3 km) covering the Adriatic regions, initialized using the WRP low-resolution output.

For what concern the oceanographic component the circulation model ROMS and the wave averaging model SWAN are used together at high horizontal resolution ( 1 km). The vertical grid of ROMS consists of 30 sigma layers and 67 sources of fresh water (Po river included) are used. The exchange of data between models in run time is performed by the Model Coupling Toolkit (MCT) and it is set to happen every 10 minutes of model time. The exchange is two- ways, therefore each component of the system influences the dynamics of the other components.

In this work preliminary results will be presented for a case study. The impact of the ocean-atmosphere coupling will be briefly addressed by comparing results with the ones obtained by a weather forecast (no coupled) and an ocean forecast (only ROMS+SWAN coupling). Moreover, sensitivity to SST initialization will be discussed.

The development of a wave model coupled with a weather prediction model is one of the expected output of the AdriaMORE project.

### **Biografia**

*Alessandro Coluccelli graduated in Environmental Marine Science in 1999. He worked for the Operational Oceanographic Group at INGV, where he gained a strong background in the development of marine forecasting systems. Since 2006 he works at the Oceanography Laboratory at DiSVA- UnivPM, where he acquired expertise in oceanographic instrumentation and data analysis, besides the forecasting activity. Currently his researches are aimed at studying applications of coupled physics-biologics models.*