

Post-doctoral position on

« Impact and VARIability of Sub-Mesoscale in the MEDITerranean Sea (IVASMED) »

Contract duration: 1-3 years (depending on results obtained the first year and the profile of the candidate)

Starting date: Before January 1st 2016

Laboratory: The IVASMED project is managed by ENSTA-ParisTech and Laboratoire de Météorologie Dynamique (LMD). Strong interactions with CNRM, LOCEAN and SHOM are expected.

Scientific background: The north-western Mediterranean (NWM) is a highly favorable area for observing a large diversity of dynamical oceanic processes that are relevant for the general circulation and marine ecosystem (winter convection, shallow circulation above the plateau, steep continental margin slope with canyons, coastal current, upwellings, etc ...). In particular, the current along the northern margin (Millot 1999), which meanders and forms mesoscale eddies, drives key processes in cross-shore exchanges (Langlais, 2007, Ourmières et al. 2011) and mixing in general. Winter convection that takes place in the Gulf of Lion fuels the Mediterranean thermohaline circulation (Schott et al. 1996), with strong interannual variability (Schroeder et al. 2008). Mesoscale and sub-mesoscale structures play an important role in the transport of water masses formed locally and in the Eastern Mediterranean Sea, (Beuvier et al., 2012; Testor and Gascard 2003, 2005, Bosse et al. 2015). To better characterize and understand these processes, we use in-situ data, satellite images and numerical models with increasingly high resolution to resolve meso to sub-mesoscale (filaments, eddies, <10km).

Job Description: The main objectives are to proceed with the already existing simulations and to lead and manage their scientific exploitation. These simulations have been developed in the framework of the AGRIF-MED project, and consist in a set of twin simulations with the NEMO-MED12 model and 3 different zooms at 1/36° implemented in the 3 areas of deep water formation in the Mediterranean Sea, using the AGRIF module embedded in NEMO. The aim is to investigate the role of deep and intermediate water formation areas in the thermohaline circulation of the Mediterranean Sea. The second objective, still using the AGRIF nesting tool, is to build a very high resolution version of the model (up to ~1km) in the NWM able to deal with sub-mesoscale processes and the interannual variability associated to the small scale structures that seem to play a dominant role in shaping the physical and biogeochemical environment. This approach will be compared to the long term and high resolution in-situ dataset provided by the MOOSE network and the numerous oceanic cruises performed during the period 2007-2014. Using eddy detection algorithms, we aim to quantify the mass, heat and salt transport outside of the zone of formation, associated with the different classes of eddies detected, and define their subsequent role in the general circulation of the Mediterranean Sea.

Qualifications: Candidates must hold a PhD in physical oceanography or applied mathematics. Experience with numerical models and expertise with model / data comparison are highly advantageous.

Compensation: net salary will be 2000-2400€ (net)/month depending on experience.

Contact: More information about the project can be obtained directly by email to Thomas Arsouze : thomas.arsouze@ensta-paristech.fr. Interested candidates should send their application consisting of a CV, a motivation letter and the contact of two references.