

## **Postdoctoral fellowship (24 months) : vertical coordinates optimization and impact on ocean circulation physics**

Ocean circulation models are generally discretized on 3D grid. The physics of the modeled ocean is very sensitive to the numerical choices and approaches. The COMODO project (COMMUNAUTÉ DE MODÉLISATION OCÉANOGRAPHIQUE) has been supported by the French research agency. It aims at improving the numerical recipes in oceanic models and rationalizing the numerical choices. The project is organized in work packages and takes advantage of a panel of case studies performed using the five numerical models (NEMO, HYCOM, ROMS, MARS, SYMPHONIE).

The postdoctoral fellowship concerns the WP 5 addressing the vertical coordinates. The numerical choices in the different models are numerous and can trigger significant impacts in the representation of the oceanic circulation. The choices can be made either on the definition (geopotential, density, terrain-following, generalized) or on the way to share the level on the vertical. Innovative approaches have been implemented to get the respective advantages of the eulerian and lagrangian coordinates (hybrid and ALE coordinates). The modeling community can use a large panel of vertical coordinates but the sensitivity on the modeled ocean physics is not enough documented.

The candidate will first analyze the sensitivity of the generation and propagation of baroclinic tides. The representation of the main vertical baroclinic modes will be addressed. The case study "continental slope" of the COMODO project is particularly suitable for this study. This model configuration is 2DV and can be run in very high resolution to get a "truth". The different vertical sampling strategies can be assessed by comparison to this reference. The interest of hybrid and ALE coordinates can be quantified. A similar approach can be performed on the sub-inertial frequencies (mesoscale dynamics). Vorticity budgets will provide insights on the interactions between currents and topography.

The position is funded by the french research agency (ANR). It is expected to begin in February 2013 and is localized in the SHOM research department in Brest.

### **Profile :**

The candidate must be Phd in Oceanography, Geophysical fluid dynamics ou applied mathematics. A previous experience in numerical modeling is essential.

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Résumé and motivation letter must be sent to [rh@shom.fr](mailto:rh@shom.fr) and [cyril.lathuiliere@shom.fr](mailto:cyril.lathuiliere@shom.fr).