Project: **548**

Project title: **INMEDIATO**

Project lead: **Uwe Mikolajewicz**

Report period: **1.1.2014 - 31.12.2015**

Text: maximum of two pages incuding figures.

During the reporting period the project had no computing time. Nevertheless, further analysis of the output obtained during previous period was done.

The effect of tides apparently has a basin scale effect on the ocean circulation through a change in the barotropic streamfunction (tidal runs have an additional cyclonic forcing in the North Atlantic). This effect has already been reported to impact on the Gulf stream separation (see Sein et al., 2015), which is far away of our initial focusing region (Gulf of Cadiz and Mediterranean Outflow).

A thoroughly review of existing literature does not provide a conclusive effect on the global effect of residual tidal circulation on global circulation. The most recent work by Bessieres et al. (2008) conclude that its effect if negligible, however they calculated the tidal residual global circulation, and afterwards it was incorporated as an external forcing to an ocean climate model. Thus, they did not account for the non-linear interaction between the tidal dynamics and the general ocean circulation.

To clarify this issue we decided to set up and run two experiments with our configuration MPIOM SPAN10, eliminating all ocean forcings and keeping only the luni-solar tidal potential. One experiment considered a homogeneous global ocean, the other one considers a homogeneous stratifies global ocean. Currently, we are analyzing the outputs to compare the results to the stimulates provided by Bessieres et al. (2008)

Bessieres L., Madec G., Lyard F. (2008) Global tidal residual mean circulation: Does it affect a climate OGCM?, Geophysical Resear Letters, 35, L03609

Sein, D. V., U. Mikolajewicz, M. Gröger, I. Fast, W. Cabos, J. G. Pinto, S. Hagemann, T. Semmler, A. Izquierdo, and D. Jacob (2015), Regionally coupled atmosphere-ocean-sea ice-marine biogeochemistry model ROM: 1. Description and validation, J. Adv. Model. Earth Syst., 7, 268–304, doi:10.1002/2014MS000357.