## Neuantrag auf Blizzard für EU Projekt EMBRACE

Project: Project title: Earth system Model Bias Reduction and assessing Abrupt Climate change (EMBRACE) Project granted by EU FP7: (grant number: 282672) Project administrator: Stefan Hagemann (MPI-M) Accounting period: 1.1.2012-31-12.2012

## Abstract

EMBRACE brings together the leading Earth System Models (ESMs) in Europe around a common set of objectives to improve our ability to (i) simulate the Earth System and (ii) make reliable projections of future global change. EMBRACE builds on the existing European collaboration network in Earth System Modelling and will be the main European input to international efforts in this field over the coming 5 years. The project has a number of key goals; (i) to reduce the main, known biases in existing European ESMs, (ii) to fully evaluate ESM simulation capabilities and improvements made in the project, (iii) to increase the realism of, and interactions between, the physical and biogeochemical components of ESMs, (iv) to assess the risks of abrupt or irreversible changes in key components of the Earth system, in response to the most recent greenhouse gas, aerosol and land-use scenarios proposed for the IPCC AR5. The primary ESM biases targeted for improvement include, (i) the representation of moist atmospheric convection and links to coupled tropical variability and precipitation. (ii) equatorial and coastal ocean upwelling and their impact on the global climate system and carbon cycle, (iii) coupled processes controlling physical and biogeochemical mixing in the Southern ocean, (iv) soil hydrology and its coupling with the atmosphere and (v) the terrestrial carbon cycle, through a more realistic treatment of climatevegetation interaction. Improvements will be evaluated in the context of the full range of CMIP5 historical simulations, with the CMIP5 protocol forming the basis for future climate projections made to assess the risk of abrupt changes. A cross-cutting theme will be the impact of improved process description, combined with increased coupled model resolution, in reducing ESM biases and improving their reliability of future projections.