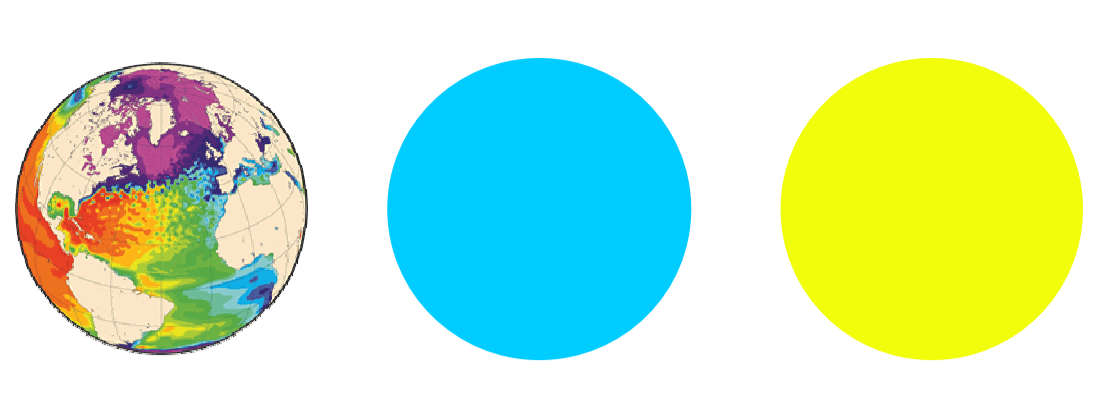


Regional activities in Mercator-Ocean : from a model intercomparison study on the Bay of Biscay towards a regional operational system on the IBI domain.

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Introduction

In the framework of MyOcean & ECOOP – European projects of ocean operational systems from global to region scales & from regional to coastal scales resp.– Mercator-Ocean with the collaboration of Puertos del Estado have been developing a high resolution regional system (1/36° ~ 2km) allowing the local high frequency processes to be accurately resolved. The system covers the Iberia-Biscay-Ireland (IBI) area & will provide robust boundary conditions to the coastal systems of IBI partners.

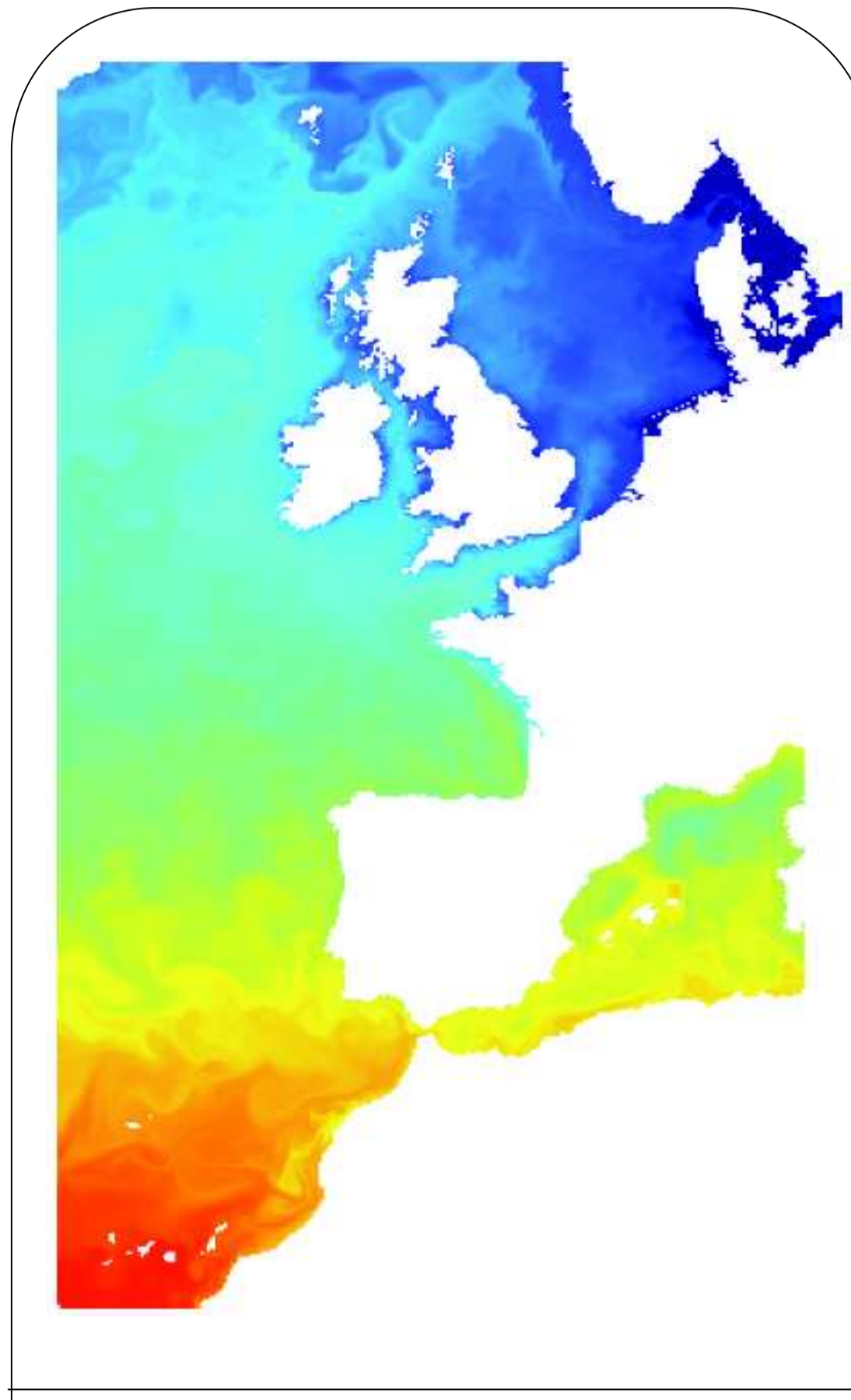


Fig.1 : SST map of the new Mercator regional system

Modelling strategy

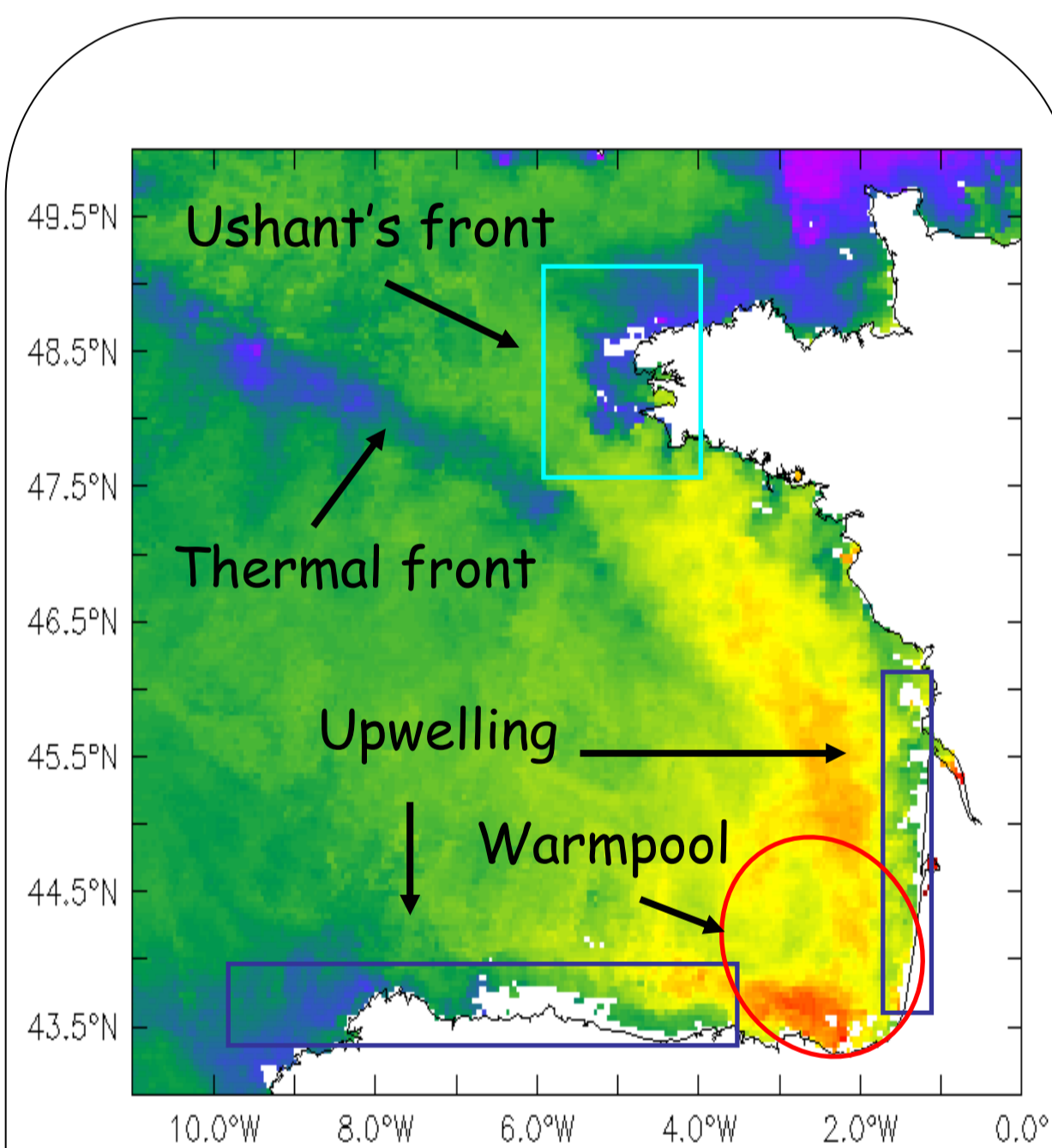


Fig.2 : SST MODIS map showing the main hydrological processes in the Bay of Biscay.

All the developments as well as the validation have preliminary been carried out in a 1/36° resolution test configuration of the Bay of Biscay in the framework of a French intercomparison project (G. Refray et al. 2008). NEMO, our calculation code, has been confronted to other coastal models: SYMPHONIE (Marsaleix et al., 2008) and MARS (Lazure & Dumas, 2008) used by POC-CNRS & IFREMER resp.

Conclusion - perspectives

The implementations in the NEMO has been validated in a test configuration of the Bay of Biscay which has shown quite sufficient results against observations & other models normally more adapted to the regional coastal simulations. The first simulations of the IBI model including these developments have been carried out & the improvements about the regional high frequency processes among other are obvious.

Now the regional Mercator team must go on its work regarding the validation with new local data bases & find a new regional data assimilation method before making operational the IBI model.

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Developments

The NEMO-OPA calculation code (Madec et al., 2008) usually used for global or basin model configurations has been adapted for the needs of the regional model :

- New Advection Scheme : QUICKEST+ULTIMATE (Leonard, 1979,1991)
- Time splitting : barotropic & baroclinic time steps
- New OBCs : - barotropic OBC : Characteristic method (Blayo et al. 2005) - baroclinic OBC : clamped
- Non linear free surface : VVL (Levier et al. 2007)
- High frequency atm. forcings

Intercomparison & Validation

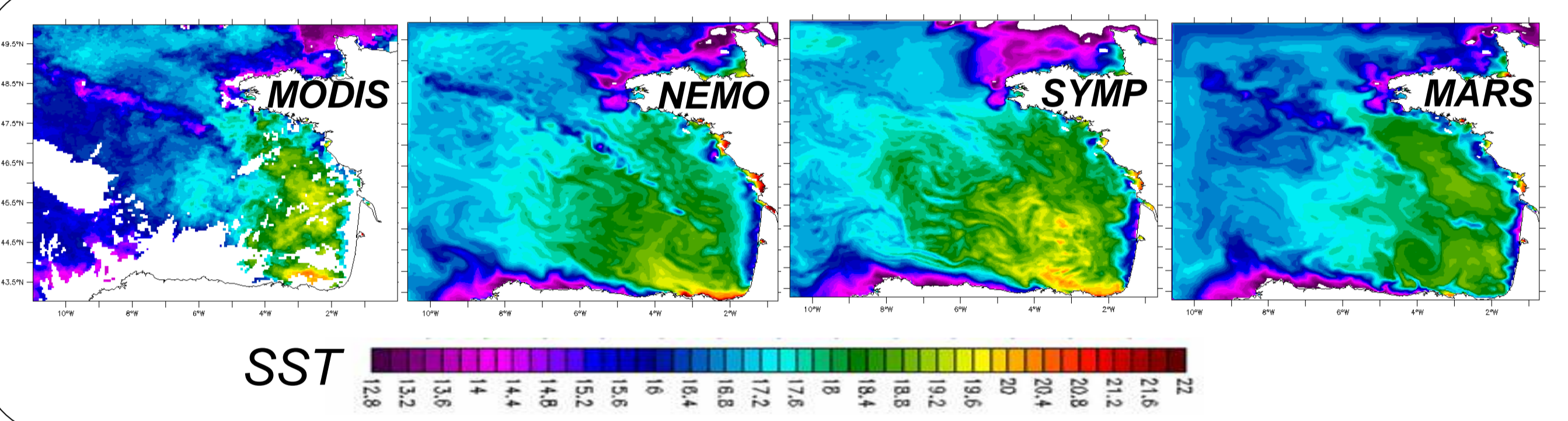


Fig.3 : June events in the Biscay Bay

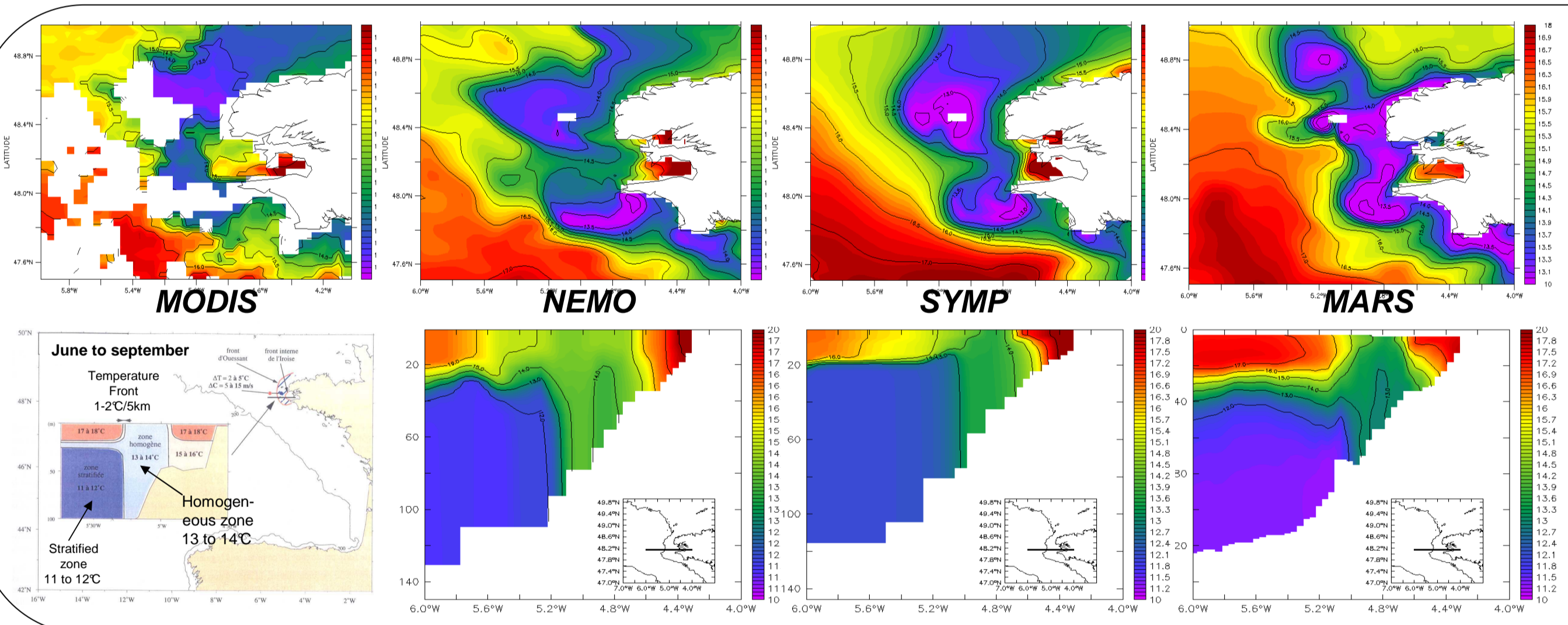


Fig.4 : Ushant front

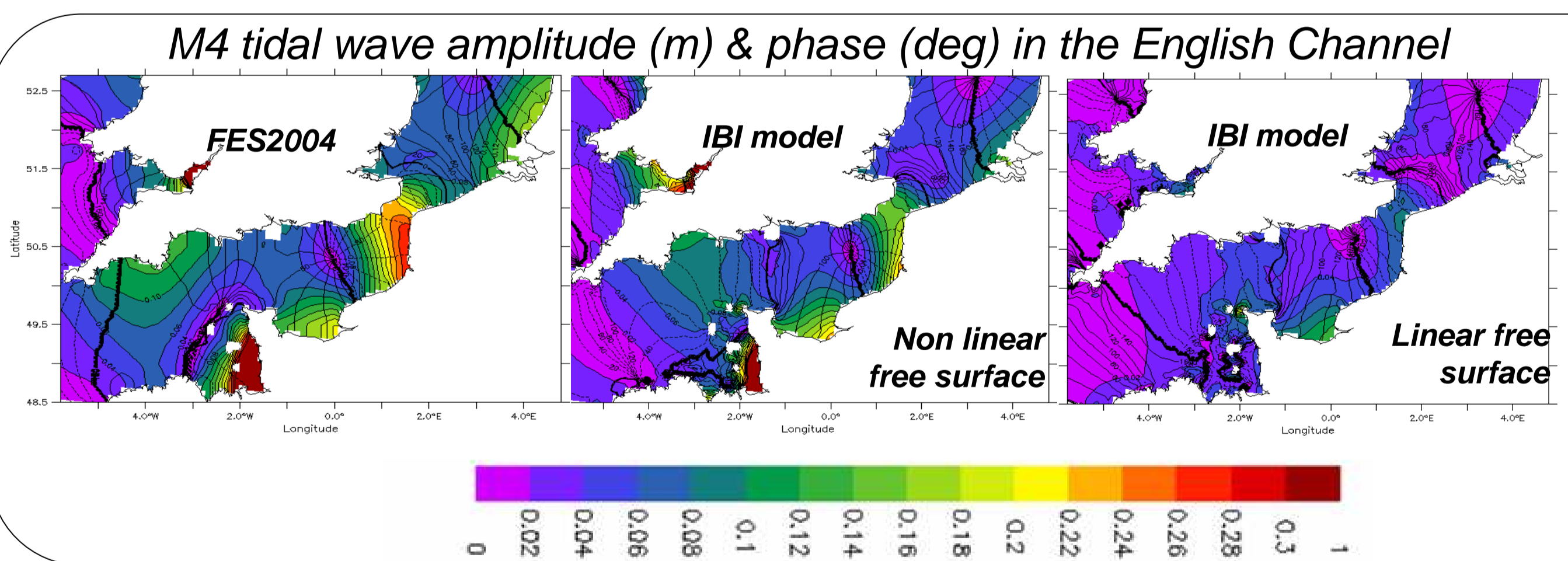


Fig.5 : Impact of non linear free surface on M4 amplitude

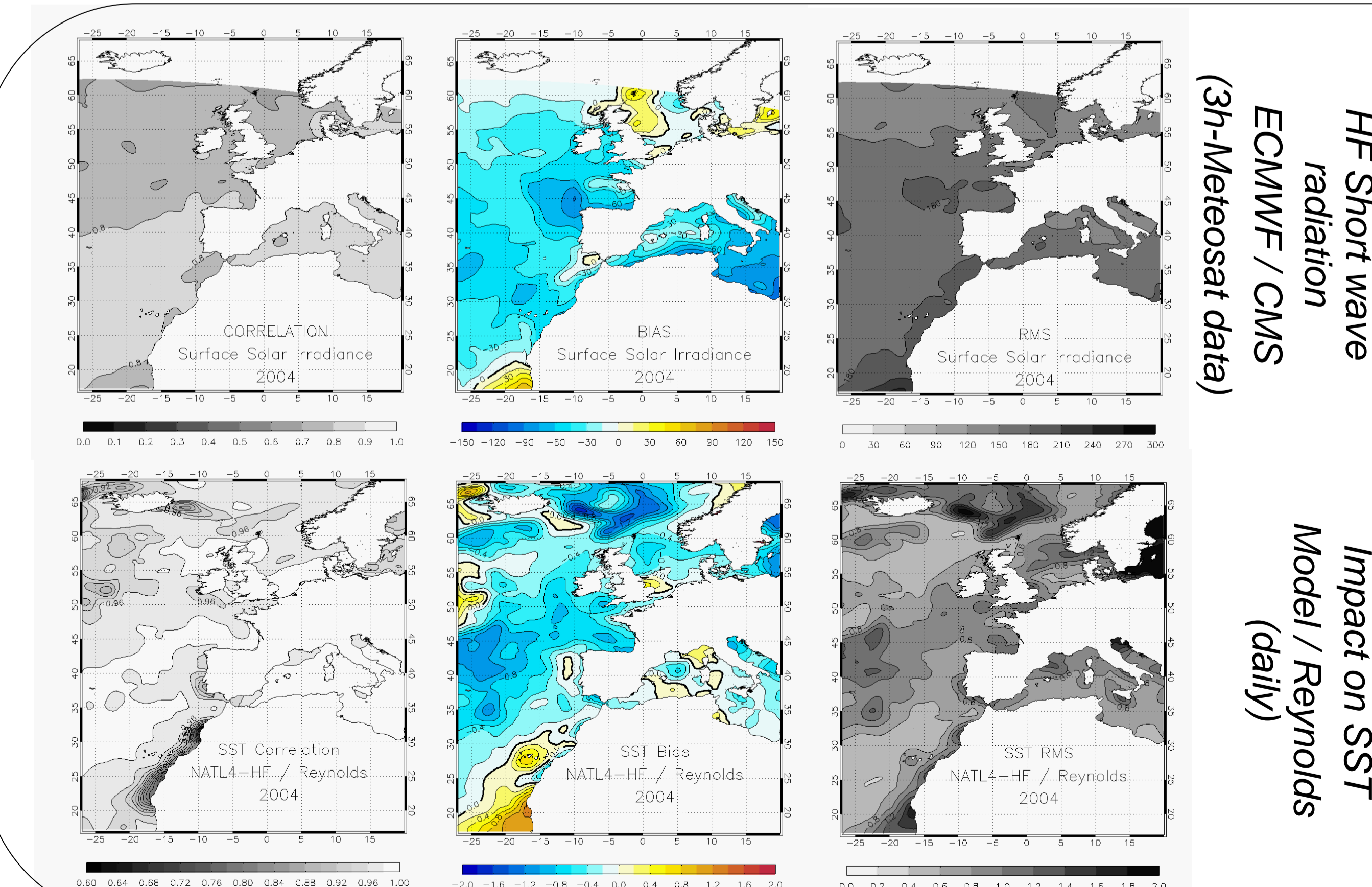


Fig.6 : 3-hourly atm. Forcings : validation & sensitivity

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