Geophysical Research Abstracts,
Vol. 11, EGU2009-8942, 2009
EGU General Assembly 2009

Impact of the ocean diurnal cycle on the intraseasonnal variability of Sea Surface Temperatures in the mid-latitudes Atlantic Ocean

V. Guemas (1,2), D. Salas-Mélia (1), M. Kageyama (2), H. Giordani (1), and A. Voldoire (1)

(1) CNRM/GAME, Meteo-France, CNRS, Toulouse , France (virginie.guemas@meteo.fr), (2) LSCE, CEA-CNRS-UVSQ, Gif-Sur-Yvette, France

Some recent studies have shown that the ocean diurnal cycle could increase the intraseasonal variability of the Sea Surface Temperatures (SST) in the tropics (Shinoda and Hendon, 1998; Bernie et al, 2005; Shinoda, 2005). This study aims at extending these analyses to the mid-latitudes.

To conduct these analyses, the CNRMOM1D 1-dimensional ocean model is forced with ERA40 reanalysis data with a 1 hour frequency in solar heat flux (6h hours for the other forcing fields). The turbulent vertical mixing scheme (Gaspar et al., 1988) is based on the parameterisation of the second-order turbulent moments expressed as a function of the turbulent kinetic energy. The model has 124 vertical levels with a vertical resolution of 1m near the surface and 500m at the bottom.

This high vertical resolution combined with a high temporal forcing resolution allows to simulate a realistic diurnal cycle of the oceanic upper-layers. This experiment is compared with one forced on a daily time-step. By comparing both experiments, the impact of the ocean diurnal cycle on the intraseasonnal variability of sea surface temperature anomalies is assessed. We show that the phase of the SST variability is affected and this impact is strongly associated with the non-linear interactions between the diurnal cycle in mixed layer depth and surface forcings.