Geophysical Research Abstracts,
Vol. 10, EGU2008-A-03819, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-03819
EGU General Assembly 2008

Spatial Distribution of the 21^{st} century Climate Change signal in the Mediterranean

M. A. Lucas and S. Somot

CNRM/GMGEC/EAC

Météo-France 42 av. Gaspard Coriolis 31057, Toulouse Cedex ,France (sprywale@gmail.com / Fax : +33 56-107-9610)

The Mediterranean is a recognised hotspot for climate change in the 21^{st} century. Up to now, the issue of the impact of the global climate change on the Mediterranean Sea has been only tackled with low resolution AOGCM (IPCC, 2007) or high resolution ocean-only models (Thorpe and Bigg, 2000; Somot et al. 2006). The well-known drawbacks of these two approaches can be resolved by using a high resolution Atmosphere-Ocean Regional Coupled Model (AORCM) centered on the Mediterranean basin. Such a model has been recently developed at CNRM, Météo-France (Somot et al. 2007). It consists of the coupling of a global spectral AGCM (ARPEGE-Climate), the variable resolution of which is maximum over the Mediterranean region (50 km) and a Mediterranean sea regional OGCM (OPA-MED8) with a resolution of 10 km. Two twin 140-year numerical experiments starting in 1960 were run with this AORCM. The first one is a control simulation representing the present climate whereas the second one follows the observed GHG and aerosol conditions up to the year 2000 and the SRES-A2 scenario forcing beyond. The basin wide increase in temperature is of 1.9˚C and the basin wide salinity increase is of 0.35 PSU. However, the local response to the increase in anthropogenic input varies from sub-basin to sub-basin, depending on the physical processes that occur. These will determine how and when the warming and increase in salinity propagate into the water column. For instance, in regions such as the Gulf of Lions convection allows for a more uniform depth distribution of the temperature and salinity signal. There are also indications that the Atlantic signal can be significantly amplified by processes in the eastern basin.