Geophysical Research Abstracts, Vol. 8, 06698, 2006
SRef-ID: 1607-7962/gra/EGU06-A-06698

Manifestation of decadal MOC variability in the upper-layer tropical Atlantic

S. Hüttl, C. Böning

Leibniz-Institut für Meereswissenschaften an der Universität Kiel, IFM-GEOMAR, Düsternbrooker Weg 20, 24105 Kiel (shuettl@ifm-geomar.de)

The upper layer circulation in the western tropical Atlantic can be understood as a superposition of the northward, interhemispheric flow associated with the deep meridional overturning circulation (MOC) and the shallow subtropical-tropical cells (STCs). These cells connect the subduction zones of the subtropical gyres with the equatorial regime of eastward currents. Analysis of different interannual forded runs of a global (ORCA) and an Atlantic (FLAME) ocean model show variability of the cells on interannual to decadal timescales. While the interannual signal can be understood as a reaction to the locally varying wind-field, the decadal signal is found to include a contribution associated with the MOC variability generated in subpolar regions. The similarity in the main signatures of the MOC-signal in the different model hindcasts suggests a quite robust simulation of the main mechanisms involved in the decadal modulation of the STC transports. The time-lag between an anomalous deep water formation in the subarctic Atlantic and a first, significant dynamical reaction of the equatorial current system is found to be O(5 years) as suggested by more idealized model experiments. The amplitude of the MOC-related signal in the STC-transports was, however, of only O(0.3Sv) during the last decades, much weaker than the signal due to local wind forcing of O(2Sv).