Geophysical Research Abstracts, Vol. 9, 09607, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-09607

Mean circulations and variability between 1958 and 2004 as simulated by the DAKKAR eddy permitting 1/4˚ global ocean/sea ice model driven by CORE or ERA40 atmospheric forcing.

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The international DRAKKAR program has built a hierarchy of ocean/sea-ice models to simulate and study the dynamical processes involved in the oceanic variability and scale interactions since the 1950's. This hierarchy includes 1/2˚ and 1/4˚ configurations of the Global Ocean on the one hand, 1/4˚ and 1/12˚ (presently being built) models of the Atlantic Ocean between 30˚S and 80˚N on the other hand. All models are forced over the last decades by various reanalysed and observed atmospheric fields through bulk formulae. This presentation first summarises how new numerical methods have improved the representation of general circulation patterns at eddy permitting resolution. It then compares the variability simulated by the 1/4˚ global ocean/sea-ice model under two different atmospheric forcing sets, based on a combination of satellite observations with either the NCEP reanalysis ("CORE" forcing) or ERA40, over the period 1958-2004. A monitoring of the simulated ocean circulation is presented for this 47 year long period, which points out differences and similarities in variability due to differences in forcing. Coarser 1/2˚ configurations, driven with identical forcing conditions are also used to identifying robust and non robust variability patterns. The analysis gives a special focus to variability in transport and circulation patterns in subtropical and subpolar gyres, in the Southern Ocean, and in sea-ice extent and thickness.