

The Mediterranean Conveyor Belt

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Abstract

Multi-decadal integrations of the Pacanowsky, Dixon and Rosati version of the Bryan and Cox general circulation model have been carried out in order to study the characteristics of the Mediterranean conveyor belt. The model is forced at the air-sea interface by monthly mean atmospheric winds, air temperature and relative humidity to calculate bulk parameterized momentum and heat fluxes. Water fluxes are parameterized by a Newtonian relaxation term to monthly mean climatological surface salinities and the Gibraltar inflow condition is forced by an annual mean temperature and salinity structure.

The resulting overturning component of the thermohaline circulation can now be connected to the rather complex forcings of the general circulation, such as the air-sea interactions, the Gibraltar inflow/outflow system and the deep water sinking at northern latitudes (Gulf of Lyon and Adriatic Sea). We analyze the meridionally and zonally integrated mass transports in the western and eastern basins to examine the character of the overturning cell and its connection with the forcing at Gibraltar. Sensitivity experiments to different surface forcing parameters will be also shown.

