



Seasonal variability of the Red Sea water outflow examined with a locally high-resolution OGCM

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We have developed a strait-resolving OGCM to investigate the seasonal variability of the Red Sea water outflow and its interaction with the larger scale currents in the Indian Ocean. Transposing poles gives stretched coordinates in which the horizontal resolution varies from 1.5km at the exit of the Red Sea, 10-20km in the Arabian marginal seas, 80km in the Indian Ocean and 200km in the Pacific/Atlantic Oceans. With climatology atmospheric fluxes and tide generating forces, a series of 10 years integration was carried out on the Earth Simulator. The summer stopping and the winter maximum of the overflow is successfully reproduced at the BAM strait. We found that the Monsoon wind over the Indian Ocean remotely maintains the variation of the strait water exchange, in accordance with the monsoonal shoaling in the gulf of Aden. The three-dimensional structure of the Red Sea outflow water tongue in the western Indian Ocean is also described. The high salinity water at the mid-depth tends to show anticyclonic vorticity (Reddies), and is coupled with the replacing Indian Ocean intermediate water with cyclonic vorticity, an evidence of frontal instability.