



Wind-Driven cross-equatorial flow in the Indian Ocean

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World Ocean Atlas 2005 (WOA05) monthly climatology, Argo data and National Centers for Environmental Prediction (NCEP) wind-stress together with a steady state model are used to estimate the meridional velocity and volume and heat transport in the Equatorial Indian Ocean for a seven years period (2003-2009).

Total volume transport of the wind stress curl shows a northward and southward flow for the Winter and Summer Monsoon, respectively. The velocity section shows a Somali Current flowing in opposite direction in the Winter and Summer Monsoons for both database. In the Winter Monsoon, the Somali Current is shallow and flows southward near the coast with an undercurrent below it that is only appreciable with the Argo data implementation. In the Summer Monsoon and Transitional Periods, the Somali Current flows to the north and to the south, respectively, and extends to higher depths. The heat transport across the Equator presents a seasonal reversing, being -0.9/-0.8 PW to the south in the Winter monsoon and +0.5/+1.2PW in the Summer Monsoon for the WOA05 and Argo data. The annual heat transport is -1.6 and -1.4 PW for the WOA05 and Argo data respectively. For both database the heat is mainly carried out by the Somali Current to the south.