



Features of Red Sea Water Masses

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Features of Red Sea water mass can be divided into three types but best to be grouped into two different classes that are split at the potential density line $\sigma_{\theta}=27.4$. The surface water (0-50 m) and the intermediate water (50-200 m) have nearly identical types of water mass. They appear as a maxima salinity layer for the water mass that has $\sigma_{\theta} > 26.0$, and as a minimum salinity layer for water mass that has $\sigma_{\theta} < 26.0$. These types of water masses are strongly affected by mixing that is controlled by seasonal variability, fresh water intrusion of the Gulf of Aden Intermediate Water (GAIW), and eddies variability.

Two types of mixing; isopycnal and diapycnal mixing are part of important physical phenomena that explain the change of water mass in the Red Sea. The isopycnal mixing occurs at the neutral potential density line, connecting the Red Sea with its adjacent channel, the Gulf of Aden. Diapycnal mixing is found as a dominant mixing mode in the surface of the Red Sea Water and mainly due to energetic eddy activity. Density gradients, across which diapycnal mixing occurs, in the Red Sea are mainly due to large variations in salinity. The isolation of an extreme haline water mass below the thermocline contributes to the generation of the latitudinal shift and low diapycnal mixing. This finding further explains the difference of spatial kinetic mixing between the RSW and the Indian Ocean basin.