

Meridional Variability of the South Atlantic Meridional Overturning Circulation

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Satellite altimetry measurements are used to investigate the spatial and temporal variability of the Meridional Overturning Circulation (MOC) and Meridional Heat Transport (MHT) in the South Atlantic. Synthetic temperature and salinity profiles are derived from altimeter sea surface height anomaly (SSHA) along zonal sections between 20°S and 34.5°S where SSHA and isotherm depths are highly correlated. Our estimates of MOC/MHT from those synthetic temperature/salinity profiles compare well with previous estimates from expendable bathythermograph (XBT) measurements. Consistent with studies from XBTs and Argo data, both the geostrophic and Ekman contributions to the MOC exhibit strong annual cycles, and play an equal role in the MOC seasonal variations. The strongest variations on seasonal and interannual time scales in our study region are found at 34.5°S. The dominance of the geostrophic and Ekman components on the interannual variations in the MOC varies with time and latitudes.