

Meridional Changes of the South Atlantic Meridional Overturning Circulation from Satellite Measurements

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Several underway efforts involve *in situ* observations and numerical models seeking to design and establish a sustained observational system for the Meridional Overturning Circulation (MOC) in the South Atlantic. We incorporate satellite altimetry into these analyses to demonstrate how satellite measurements complement and expand the estimates of MOC from *in situ* observations in space and time in the South Atlantic. Of particular interest is to assess how well altimetry can be used to investigate the spatial and temporal variability of the MOC and Meridional Heat Transport (MHT) in this region. Our estimates of MOC/MHT compare well with previous estimates from XBT measurements. The mean values of MOC during 1993-2011 between 20°S and 35°S decreases toward the equator, but the mean MHT increases equatorward. On seasonal time scale, MOC/MHT experience the strongest seasonal variations at 35°S and the weakest at 25°S. Both the geostrophic and Ekman contributions exhibit statistically significant annual cycle, and play an equal role in the net MOC/MHT seasonal variations. The MOC/MHT also show the largest variability at 35°S on interannual time scale, which is nearly twice as strong as the variability at other latitudes. Different from the seasonal variations, our estimates suggest that the geostrophic component dominates the interannual variability of MOC/MHT during 1993-2005, with the Ekman component plays a larger role after 2005. Our preliminary results indicate that the interannual variations in the MOC show statistically significant correlation between 20°S and 35°S.