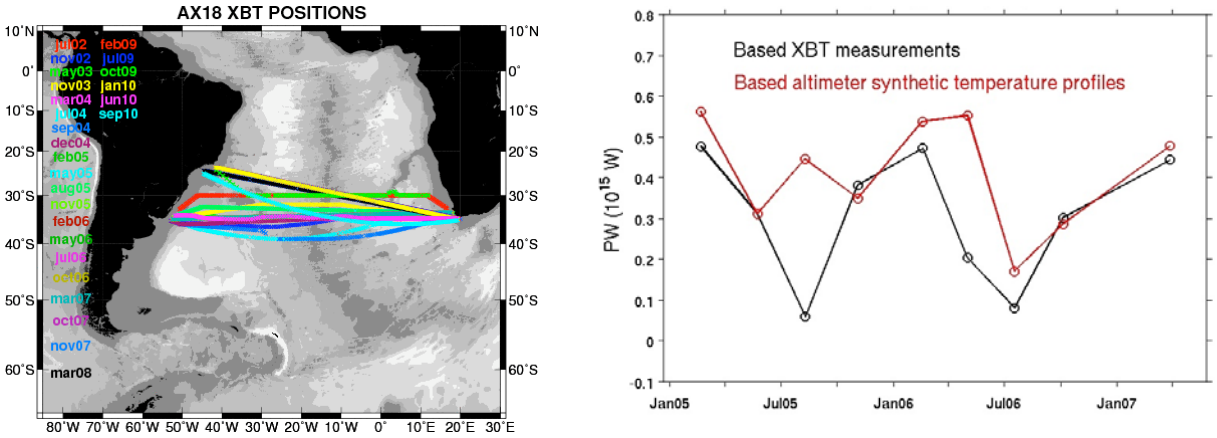
Variability of the Meridional Heat Transport and Overturning Circulation in the South Atlantic

Gustavo **Goni**[1], Molly Baringer[1], Silvia Garzoli[1], Francis Bringas[1,2], Shenfu Dong[1,2], Qi Yao[1,2], and Yeun-Ho Daneshzadeh[1].

[1] National Oceanic and Atmospheric Administration / Atlantic Oceanographic and Meteorological Laboratory
[2] University of Miami / Cooperative Institute for Marine and Atmospheric Studies

Studies using eXpendable BathyThermographs (XBTs) deployed along a zonal transect (AX18) at nominally 35°S since 2002 have shown that the geostrophic component of the circulation dominates the net meridional heat transport (MHT) and that, at the seasonal time scale, the geostrophic and Ekman components of the circulation are out of phase. Further analysis of these data has shown that the variability of the Meridional Overturning Circulation (MOC) is similarly very weak on seasonal time scales. Both XBT observations and numerical model simulation have also shown that the MOC in the South Atlantic has important contributions not only from the boundaries (Agulhas and Brazil-Malvinas Confluence regions) but also in the ocean interior. This presentation will focus on a) Presenting recent results on the variability of the Brazil-Malvinas Confluence using altimetry observations, supported by results obtained from AX18; and b) Examining a methodology that uses blended satellite altimetry together with XBT observations to investigate the year-to-year variability of the MHT and MOC along 35°S since 1993. An assessment is made on the differences between altimetry and XBT estimates. Results obtained from this study demonstrate the importance of satellite altimetry observations for MOC studies in the South Atlantic Ocean and in particular to extend the *in situ* observational record for the longer time scales needed for understanding climate dynamics. Wind fields are also analyzed to aid in the interpretation of trends in the MHT and MOC.



Figures. (left) Realizations of AX18 since 2002, and (right) preliminary estimates of meridional heat transport based on XBT and altimetry estimates since 2005.