

Interannual variability of Antarctic Intermediate Water in the tropical North Atlantic

*Yao Fu¹, Chunzai Wang¹, Peter Brandt^{2,3}, Richard J. Greatbatch^{2,3}

1. State Key Laboratory of Tropical Oceanography, South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou, China, 2. GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany, 3. Christian-Albrechts-Universität zu Kiel, Kiel, Germany

Interannual variability of Antarctic Intermediate Water (AAIW) in the tropical North Atlantic is investigated using the GECCO2 ocean state estimate and Argo data. AAIW salinity variability near the western boundary is shown to be highly correlated with the western boundary current (WBC) transport on interannual timescales. Northward propagating anomalies are associated with the WBC variability that, in turn, is related to the large-scale wind stress curl forcing by means of the Sverdrup balance. AAIW anomalies also propagate westward with the speed of baroclinic Rossby waves, indicating that the westward propagation of baroclinic Rossby waves also plays a role in the variability of AAIW characteristics. Slow eastward spreading of AAIW anomalies is also identified on decadal timescales. Understanding the observed interannual and decadal variability of AAIW salinity is important to properly interpret salinity changes with respect to changes in the hydrological cycle.

Keywords: Interannual variability of Antarctic Intermediate Water (AAIW) in the tropical North Atlantic, Meridional propagating AAIW salinity anomalies associated with the western boundary current variability, Zonal propagating AAIW anomalies related to baroclinic Rossby wave propagation