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Western Boundary Currents (WBCs) play an essential role in the meridional distribution of heat, mass, and freshwater of the global ocean. They constitute the primary pathway for basin-scale heat exchange between the tropics and the midlatitudes. Because they are highly variable narrow meandering jets, estimating the transport of WBCs poses signicant challenges. Our first goal is to provide state of the art estimates of the volume transport in the subtropical gyre WBC regions of the Pacific, Atlantic, and Indian Ocean using a combination of high-resolution expendable bathythermograph (HRX), Argo float profiles and trajectories, and altimetric datasets. Transport estimates are made both for the poleward WBCs and for their local recirculations. Quarterly HRX sections similarly occupied from the 1990s to 2013 provide 0-800 m temperature profiles. Argo temperature profiles are used to expand HRX temperature data to 2000-m. Altimetric height provides a correction of profile anomalies to mean fields in the upper 2000-m. Large-scale salinity adjustments to the 2004-2013 mean temperature/salinity relation are determined using Argo monthly anomaly fields of temperature and salinity. Absolute geostrophic velocity is assessed using Argo float trajectories at parking level. Our second objective is to study the time-variability of the transport in WBC regions in all three basins. WBC transport variability prior to the Argo era is addressed using combined altimetry/Argo data.
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