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An analysis of the three-dimensional circulation in the subtropical South Atlantic based on velocity fields derived from Argo data and AVISO sea surface heights provides new insight into the mean zonal and meridional transports in the subtropical gyre. The velocity fields reveal the reduction of the latitudinal extent of the subtropical gyre with increasing depth that is mainly due to a southward shift of the westward branch of the subtropical gyre that is most pronounced near the western boundary. A joint analysis of zonal and meridional transports in the subtropical gyre in five 400m thick layers from the surface to 2000m reveals an interior pathway from the South Atlantic Current (SAC) to the Southern South Equatorial Current (SSEC) between 18W and 1E. At 35S the northward transport in this longitude band ranges from 6.8Sv in the shallowest layer to 3.9Sv in the deepest layer, and adds up to total transport of 26.0Sv in the upper 2000m. Within the uncertainty of the estimated transports, these northward transports are consistent with the west-to-east weakening of the SAC and the east-to-west strengthening of the SSEC in 18W and 1E. With respect to the boundary currents that are part of the subtropical gyre, the southward transport of the Brazil Current in the upper 2000 m increases from 5.4Sv at 29S to 29.0Sv at 34S. From there on the transport decreases to 7.3Sv at 36S before increasing again to 24.0Sv at 38.5S. The latitude-dependence north of 35S may be due to the small recirculation of the Brazil Current that has a northward transport of 14.8Sv at 35S in the upper 2000 m. Along the eastern boundary, the Benguela Current, is 23.9Sv in the upper 1200 m at 35S. To the east of this current, the Benguela Poleward Undercurrent can be detected in the velocity field as well as in the salinity field derived for the core of the Antarctic Intermediate Water. This current extends as far south as 30S and potentially even to 33S.
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