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Enhanced array for AMOC observation in the South Atlantic

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The South Atlantic Meridional Overturning Circulation (SAMOC) is a scientific program aiming to investigate and promote the progress of the knowledge regarding the AMOC through the Atlantic basin. The installation and maintenance of the SAMOC Basin-wide Array (SAMBA) along the latitude of 34.5°S was an accomplishment that involved institutions and scientists from Argentina, Brazil, South Africa, France, South Africa, and the United States, among others. The observational backbone on the western side includes measurements from pressure sensor inverted echosounders (PIES) and the realization of periodical maintenance cruises.

In this study we show the analysis from two CPIES instruments (with an integrated currentmeter) moored at 31°W and at 18°W (sites E and F along the SAMBA-West line, respectively at the western flank of the Rio Grande Ridge and at the western side of the Mid-Atlantic Ridge). The time series span the period from 2019 to 2023, a unprecedented continuous sampling of the thermohaline structure of the ocean's interior which will contribute to resolve the basin-wide transport variability. These two sites represent an important extension of the original SAMBA-West and they also helped us to capture details of the lower layer water mass structure and circulation. These in-situ measurements allowed us to improve the accuracy of the AMOC and the variability of the transport contribution from that sector of the South Atlantic. Fluctuations from intra-annual to interannual in the geostrophic transport between E and F are compared to previous estimates from the SAMBA-West and the whole array.

Topic

Value of AMOC observing –what have we learned?

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