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The low frequency variability of the South Atlantic circulation

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In this presentation, we analyze the structure of the low frequency variability in the South Atlantic circulation from nearly ten years of altimeter data. The annual variability is distinguished by an absolute maximum in the southwestern Atlantic that is characterized by a strengthening of the Brazil Current transport during the austral summer and a weakening towards the winter. These seasonal variations do not appear to be driven by the wind stress curl over the subtropical basin, but by the winds located in the region between 40 S and 50 S. The interannual variability of the basin-scale circulation is characterized by a dipole-type mode with peaks of opposing phases in the subtropics and the western subpolar region. This mode is modulated by a time series, characterized by a 4-5 year period. The combination of the spatial and temporal patterns indicates a strengthening of the oceanic circulation in the subtropical gyres from 1992 to 1996 and a weakening from 1996 to 2001. The subpolar expression of this dipole is characterized by a maximum over the region dominated by the Zapiola eddy (˜47 S 45 W). The anticyclonic circulation over the Zapiola eddy weakened from 1992 to 1996 and strengthened from 1996 to 2001. The sea level pressure and the wind stress curl showed basin scale variations similar to those of the SSHA. The lowest mode of sea level pressure variability represents changes of the anticyclonic circulation over the subpolar basin. The structure of the wind stress curl show changes similar to those of the SSHA. Our analysis indicates the low frequency variability of the ocean circulation is related to a direct Ekman response in the subpolar basin and an indirect, geostrophic change of the circulation in the subtropics.