

## **Atlantic Meridional Overturning Circulation: Its multidecadal variability in the Tropical Atlantic**

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The North Brazil Current (NBC) connects the North and South Atlantic, and has been viewed as the major pathway for the surface return flow of the Atlantic Meridional Overturning Circulation (AMOC). We will show that the NBC geostrophic transport, calculated from 5 decades of observations near the western boundary off the coast of Brazil, reveals a multidecadal variability. This multidecadal variability lags by a few years Labrador Sea deep convection, a hypothesized forcing of the AMOC. The NBC transport time series is coherent with the Atlantic Multidecadal Oscillation (AMO) in sea surface temperature, which also has been widely linked to AMOC fluctuations in previous modeling studies. The results thus suggest that the observed multidecadal NBC transport variability is a useful indicator for AMOC variations. The suggested connection between the NBC and AMOC is assessed in a 700-year control simulation of the GFDL CM2.1 coupled climate model. The model results are in agreement with observations and further demonstrate that the variability of NBC transport is a good index for tracking AMOC variations. We will further explore the relationship between the multidecadal variability of tropical Atlantic AMOC and the subsurface temperature and salinity of subpolar-subtropical North Atlantic, that have been the major constraints on AMOC in ocean reanalysis. These relationships in different data assimilation products will be investigated to understand the large spread of AMOC low frequency variability in these products.