

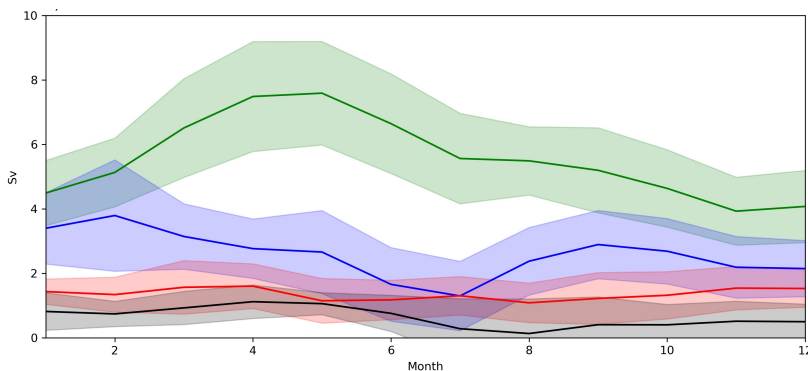
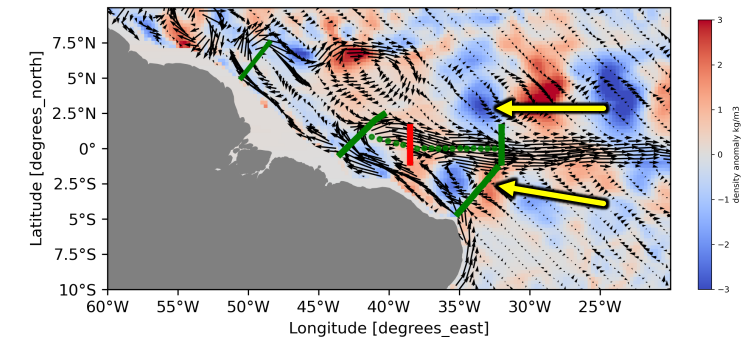
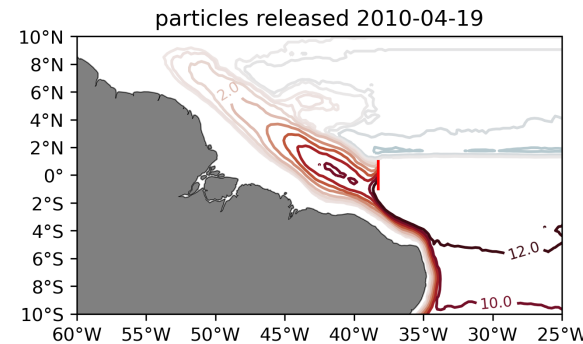
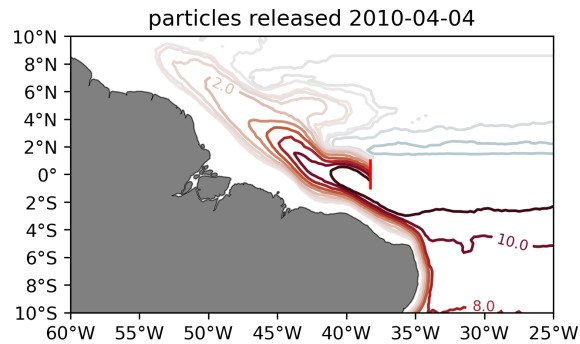
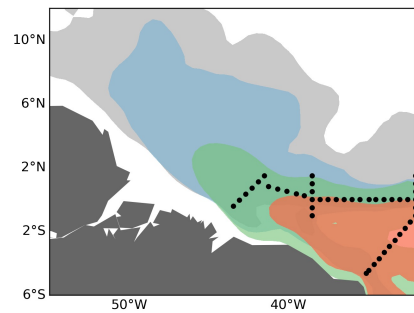
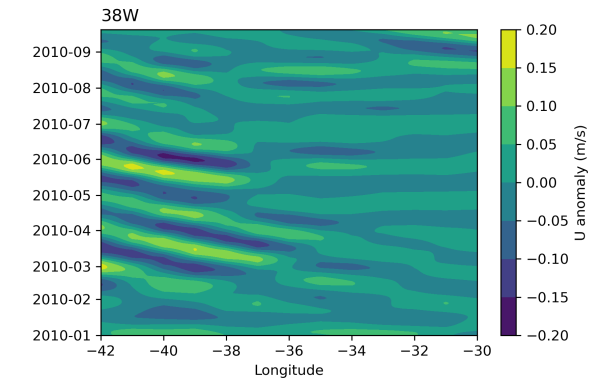
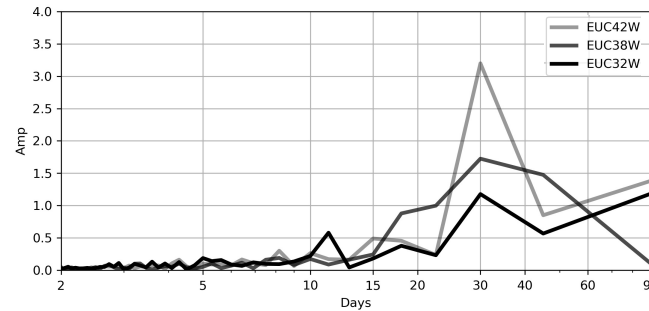
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Objective

In the western Tropical Atlantic thermocline waters, carried by the North Brazil Current (NBC), retroflect to feed the Equatorial Undercurrent, one of the strongest currents in the Atlantic Ocean. The objective of this work is to describe the spatio-temporal variability of the NBC-EUC retroflection system from short-term to seasonal scale.

Methods

We use the reanalysis product GLORYS2v4 to characterize the propagation anomalies through the NBC-EUC retroflection. With a time-frequency analysis at different cross-sections in the NBC and EUC, we figure out the dominant signals in time-series of mass transport. Further on, the Lagrangian simulator OceanParels helps us to see how these fluctuations change the water mass pathways by tracking particles backward in time. Particles are released at the maxima and minima of the oscillation.



Results

Fluctuations between 20 to 50 day periods are dominant at the EUC cross-section (38W). Interestingly, these oscillations propagate westward indicating the presence of Tropical Instability Waves (TIW). The existence of close-equatorial TIW is corroborated with density anomaly signals located south and north of the EUC core. This wave-current interaction results in important changes in latitudinal position and current intensity of the NBC-EUC retroflection.

The seasonal cycle of the NBC-EUC retroflection is characterized by a first maxima peaking in boreal spring with waters retroflecting mainly at the equatorial band. The presence of a second maxima in boreal autumn is feed by waters retroflecting further north, coinciding with the formation of the North Equatorial Counter Current (NECC).