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The influence of the Subtropical Highs in the development of the Atlantic Niños since 1970s

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Tropical Atlantic basin sea surface temperature is characterized by an interannual variability mode known as Atlantic Nino due to its similarity with the Pacific counterpart. Recent studies have found how, since 1970s, the Atlantic Nino appears together with an opposite phase of the Pacific Nino and how the Atlantic Ocean has a leading role in this interbasin connection. Also, in a recent study, it has been shown how the Atlantic seems to favor active thermocline feedbacks in the Pacific which could create more intense and dynamical ENSO since the 1970s.

A particular feature of the Atlantic Niño in recent decades is its spatial pattern, which presents a westward extension of the equatorial SST anomalies. Observational analysis shows how this Atlantic pattern seems to be influenced by alterations in the atmospheric Subtropical Highs during the months before the Atlantic Niño development, modifying not only the heat fluxes but also the eastern coastal upwelling systems and the western equatorial winds.

The present study analyses the contribution of the anomalous subtropical high pressure systems on the origin and development of sea surface temperature anomalies over the Tropical Atlantic. To this aim, sensitive experiments with an OGCM have been performed by modifying the subtropical winds. Preliminary results of this set of simulations are going to be presented, highlighting the role played by each Subtropical High, as well as, the thermodynamical and dynamical processes that are at work in the development of the surface anomalies.