

Tropical Atlantic Impact on ENSO predictability

*Belen Rodriguez-Fonseca^{1,2}, Irene - Polo¹, Elsa - Mohino¹, Teresa - Losada¹, Marta - Martin-Rey⁵, Roberto - Mechoso³, Noel - Keenlyside⁴

1. Department of Physics of the Earth and Astrophysics, UCM, Madrid, Spain, 2. Institute of Geosciences, IGEO, UCM-CSIC, Madrid, Spain, 3. Department of Atmospheric and Oceanic Sciences, UCLA, Los Angeles, USA, 4. Geophysical Institute, University of Bergen, Norway, 5. Instituto de Ciencias del Mar, Barcelona, Spain

Observational studies have identified periods of enhanced ENSO predictability from tropical Atlantic variability. Some works have found that this enhancement is provided by the boreal summer Atlantic Equatorial Mode (EM) impact on the atmospheric processes that trigger the following winter ENSO phenomenon. Other works have found how the variability of sea surface temperature (SST) in the northern tropical Atlantic (NTA) during boreal spring acts as ENSOs optimal predictor. The periods of enhanced ENSO predictability appear in phase with the Atlantic Multidecadal Variability (AMV) but no physical explanation has been posed so far. Here we present a hypothesis that conciliates for the first time the existence of both relationships in observations. The results are tested in CMIP5 PI-Control simulations, which allows consideration of a large number of time-periods in which either the NTA or the EM impact ENSO are tested. Model results are consistent with our hypothesis about the switch for the inter-basin connections and the proposed mechanisms. In addition, the model bias in global SST consisting of too high values south of the equator favors some interbasin teleconnections more than others.

Keywords: Atlantic-Pacific interbasin connections, tropical Atlantic variability, ENSO predictability, CMIP5

