



Tropical North Atlantic as a potential non-stationary modulator of ENSO-European rainfall teleconnection

Jorge Lopez-Parages (1), Marta Martin-Rey (2), Teresa Losada (3), Irene Polo (3), Belen Rodriguez-Fonseca (3), and Laurent Terray (1)

(1) UMR5318 CECI/CERFACS, Toulouse, France, (2) Departament d'Oceanografia Física i Tecnològica, Institut de Ciències del Mar, CSIC, Barcelona, Spain, (3) Universidad Complutense de Madrid, Facultad de Ciencias Físicas, Dpto FTAA, Madrid, Spain

El Niño-Southern Oscillation (ENSO) impact on the North Atlantic European sector (NAE) still rises many unanswered questions. Nowadays, there is a growing evidence advocating for a non-stationary feature affecting both, the tropospheric and the stratospheric pathways, of the ENSO-NAE teleconnection. In particular, a changing link between ENSO and the spring Euro-Mediterranean rainfall has been documented in response to different phases of the Atlantic Multidecadal Oscillation (AMO). Nevertheless, the underlying physical explanations are far to be completely understood. In this study a purely tropospheric mechanism, in which the Tropical North Atlantic (TNA) plays a major role, is presented. Our results rely on the distinct capacity of ENSO to generate a zonal SST gradient over the TNA under different AMO phases. Consequently, an atmospheric response, also related to ENSO, can be triggered from the TNA to the European sector. The occurrence of this ENSO-NAE teleconnection via TNA could be subject to inter-decadal changes of ENSO properties and Atlantic background conditions. In this study this issue is analyzed in 1) observations, and 2) low-resolution and high-resolution atmospheric and coupled GCM simulations. It is expected that the novel proposed mechanism gives a step forward in the understanding of the role of the Atlantic basin as modulator of the ENSO-NAE teleconnection.