Geophysical Research Abstracts
Vol. 15, EGU2013-887, 2013
EGU General Assembly 2013

The role of the Atlantic and Pacific basins in the connection between Atlantic and Pacific Niños

Marta Martín-Rey (1,2), Belén Rodríguez-Fonseca (1,2), Irene Polo (3), and Fred Kucharski (4)

(1) Universidad Complutense de Madrid, Madrid, Spain (mmartindelrey@fis.ucm.es), (2) Instituto de Geociencias (CSIC-UCM), Facultad de CC. Físicas,Madrid, Spain , (3) NCAS-Climate, University of Reading, Reading, United Kingdom, (4) Abdus Salam International Centre for Theoretical Physics (ICTP), Earth System Physics Section, Trieste, Italy

Previous works have shown how the leading modes of the tropical Atlantic and Pacific interannual variability could be connected through an atmospheric bridge. Nevertheless, the leadership of this interabasin connection is not clear and depends on the period of time considered. Also, the mechanism in the interbasin connection is still unresolved.

The present work analyses the changes in the Tropical Pacific interannual variability due to the Atlantic. In addition, the sources of the Tropical Atlantic Variability are also identified. For this twofold purpose, a set of simulations with a partially coupled model have been performed considering i) the observed SST in the Atlantic Ocean and coupled over the Indo-Pacific basin (SimAtlVar) and ii) the observed SST over the Indo-Pacific SST and coupled to the tropical Atlantic basin (SimPacVar).

From the SimAtlVar simulation, it is shown that a modification of the Pacific Niños at multidecadal time scales is due to the remote Atlantic forcing. The Atlantic seems to favor the dynamical processes in the equatorial Pacific, which, in turn, could be responsible of the development of Pacific Niños in the first and last decades of the 20th century. On the contrary, the Pacific Niños created in the period where the Atlantic influence is not significant, are weaker and more associated to thermodynamical mechanisms.

Periods when the Atlantic forcing is more important are those associated with an alteration of both North and South Subtropical Highs in the Atlantic Ocean, preceding the development of these Atlantic Niños able to impact in the Pacific. Negative correlations between Atlantic Niños and Azores and Sta Helena High during the previous winter and spring respectively, point out the role played by the large scale atmospheric patterns in the predictability of these equatorial modes.

Finally, an important contribution to the development of the Atlantic Niños could be the ENSO phenomena. Preliminary results of the SimPacVar simulations show significant positive correlations between winter Niño3 index and Atlantic Niños at interannual time scales, pointing out the two possible directions in the Atlantic-Pacific connection.