Geophysical Research Abstracts
Vol. 17, EGU2015-9455, 2015
EGU General Assembly 2015

The impact of ENSO on the South Atlantic Subtropical Dipole Mode

Regina Rodrigues (1), Edmo Campos (2), and Reindert Haarsma (3)

(1) Department of Geosciences, Federal University of Santa Catarina, Florianópolis, Brazil (regina.rodrigues@ufsc.br), (2) Oceanographic Institute, University of São Paulo, São Paulo, Brazil (edmo@usp.br), (3) Royal Netherlands Meteorological Institute, De Bilt, Netherlands (rein.haarsma@knmi.nl)

The impact of the El Niño - Southern Oscillation (ENSO) on the South Atlantic subtropical dipole mode (SASD) is investigated using both observations and model simulations. The SASD is the dominant mode of coupled ocean-atmosphere variability in the South Atlantic. This study focuses on austral summer, when both ENSO and SASD peak. We show that negative SASD events are associated with central Pacific El Niño events by triggering the Pacific-South America wave train (PSA). The latter resembles the 3rd leading mode of atmospheric variability in the Southern Hemisphere (PSA2) and causes a weakening and meridional shift of the South Atlantic subtropical high, which then generates the negative SASD events. On the other hand, a strengthening of the South Atlantic subtropical high related to central La Niña teleconnections causes positive SASD events. Our results show that the PSA2, triggered by central Pacific ENSO events, connects the tropical Pacific to the Atlantic. This connection is absent from eastern Pacific ENSO events, which appear to initiate the 2nd leading mode of atmospheric variability in the Southern Hemisphere (PSA1). It is for this reason that previous studies have found weak correlations between ENSO and SASD. These findings can improve the climate prediction of southeast South America and southern Africa since these regions are affected by sea surface temperature anomalies of both Pacific and Atlantic oceans.