



Effects of Atlantic Meridional Overturning Circulation Change on Interannual Variability in the Tropical Atlantic and Pacific

Irene Polo (1,2), Buwen W. Dong (2), and Rowan T. Sutton (2)

(1) Facultad CC Físicas, UCM, Geophysics and meteorology, Madrid, Spain (ipolo@fis.ucm.es), (2) National Centre for Atmospheric Science-Climate, Department of Meteorology, University of Reading, Reading, UK

The Thermohaline Circulation (THC) is a key component of the climate system and its multidecadal fluctuation is thought to be an important driver of the observed multidecadal variability of sea surface temperature (SST) in Atlantic over the 20th century. Observations have revealed that concurrent with the multidecadal Atlantic SST change since the later 1960's is an intensified tropical Atlantic-tropical Pacific teleconnection with summer Atlantic Ninos favouring the development of Pacific La Ninas during the next winter via anomalous Walker circulation. However, the mechanisms that are responsible for this multidecadal change of tropical Atlantic-tropical Pacific interaction are not fully understood. The objectives of this study are: (1) to assess and to understand the tropical Atlantic interannual variability in a coupled GCM simulation, (2) to investigate the impact of a substantial weakening of the THC on the tropical Atlantic interannual variability, and (3) to assess the influence of the weakening THC on the tropical Atlantic-tropical Pacific teleconnection. We firstly analyse the Atlantic interannual variability in the coupled GCM control simulation. Then we analyze a parallel "water hosing" experiment in which the THC is substantially weakened by applying anomalous external freshwater to the North Atlantic. In addition, we propose some idealized experiments in order to give more insights into the ocean-atmosphere adjustment to an anomalous THC. Preliminary results of this set of simulations will be presented.