Geophysical Research Abstracts
Vol. 12, EGU2010-5755-1, 2010
EGU General Assembly 2010

Frequency- or amplitude-dependent effects of the Atlantic meridional overturning on the tropical Pacific Ocean

Lianke te Raa (2), Geert Jan van Oldenborgh (1), Henk Dijkstra (2), and Sjoukje Philip (1)

(1) KNMI, KS/MK, De Bilt, Netherlands (oldenborgh@knmi.nl, +31 30 2202570), (2) IMAU, Utrecht University, Utrecht, The Netherlands

Using the ECHAM5/MPI-OM model, we study the relation between the variations in the Atlantic meridional overturning circulation (AMOC) and both the Pacific sea surface temperature (SST) and the El Niño-Southern Oscillation (ENSO) amplitude. In a 17-member 20C3M/SRES-A1b ensemble for 1950–2100 the Pacific response to AMOC variations on different time scales and amplitudes is considered. The Pacific response to AMOC variations associated with the Atlantic Multidecadal Oscillation (AMO) is very small. In a 5-member hosing ensemble where the AMOC collapses due to a large freshwater anomaly, the Pacific SST response is large and in agreement with previous work. Our results show that the modelled connection between AMOC and ENSO depends very strongly on the frequency and/or the modelled amplitude of the AMOC variations. Interannual AMOC variations, decadal AMOC variations and an AMOC collapse lead to entirely different responses in the Pacific Ocean.