Geophysical Research Abstracts,
Vol. 11, EGU2009-9950, 2009
EGU General Assembly 2009
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A multi-model approach to the Atlantic equatorial mode. Impact on the West African monsoon and tropical teleconnections.

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In the framework of the AMMA-EU project, this work analyses the atmospheric response to the Equatorial mode using a multimodel approach with an ensemble of integrations from 4 AGCMs under a time varying Equatorial SST mode. The Guinean Gulf precipitation, which together with the Sahelian mode accounts for most of the summer West African rainfall variability, is highly coupled to this Equatorial Atlantic SST mode or Atlantic Niño. In a previous study, done with the same models under 1958-97 observed prescribed SSTs, most of the models identify the Equatorial Atlantic SST mode as the one most related to the Guinean Gulf precipitation.
The models response to the positive phase of equatorial Atlantic mode (warm SSTs) depicts a direct impact in the equatorial Atlantic, leading to a decrease of the local surface temperature gradient, weakening the West African Monsoon flow and the surface convergence over the Sahel.
The results also show a remote influence in both the Pacific and Indian basins; the anomalous southward location of the ITCZ over the Atlantic leads to a global subsidence over the rest of the tropics, weakening the Asian Monsoon and favouring the La Niña conditions in the Pacific.