



Multidecadal SST modulations of West African Interannual Rainfall Variability

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Different studies lead to different conclusions regarding the interannual rainfall variability over West Africa (WA): some find a dipolar pattern of anomalous precipitation, with two anticorrelated centers of variability over Sahel and Gulf of Guinea (GG), related to the Atlantic Equatorial Mode (EM); others don't find significant correlations between these two regions and a monopolar pattern is defined.

Recent studies show that the correlation between Sahelian and Gulf of Guinea's precipitation is not stationary, being the dipolar pattern alternated with a monopolar one in a multidecadal way. At these multidecadal timescales, a connection between Atlantic Niños (Niñas) and Pacific Niñas (Niños) has been also described, and could be the responsible for the appearance or not of the anomalous rainfall dipole.

In this way, for the after-1979 period, a leading tropical SST pattern has been described. This pattern is characterized by the presence of SST anomalies of opposite sign in the tropical Atlantic and the tropical Pacific, with an EM and El Niño-like structure. The disappearance of the anomalous rainfall dipole over WA has been found for the same period of time.

The present work analyzes the WA precipitation response to this leading tropical SST pattern using AGCM sensitivity studies. Our results show that the Atlantic and Pacific SST anomalies add their impacts in a quasi-linear way, producing one-signed structure of the anomalous WA rainfall, and leading to the disappearance of the anomalous dipole of precipitation after the monsoon onset.