



The relationship between African Easterly Waves (AEWs) and mesoscale convective rainfall in West Africa using DMSP- and TRMM-Satellite data.

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ABSTRACT: The aim of this work is to contribute to the understanding of the coupling between the African Easterly Waves (AEWs) and the rain-producing systems in West Africa. The most important rain-producing systems are squall lines (SLs), which account for more than 50% of the total rainfall amount in the Sahelian and Soudanian regions. In this regard, we will investigate some SL and AEW characteristics (number, intensity, etc.) for the six-month period May to October in 1998. ECMWF analyses data will be used for the examination of the AEWs, whereas METEOSAT IR-images and passive microwave rainfall-retrieval techniques will be exploited for tracking SLs. For the latter, data of the Tropical Rainfall Measuring Mission (TRMM) and from three satellites of the Defense Meteorological Satellite Program (DMSP) are available. For these satellites the rainfall-retrieval algorithm developed by Ferraro and Marks (1995) has been adjusted, both with ground measurements and the precipitation radar of TRMM, for the West African region. In 1998 dry conditions were observed at the Guinea Coast, whereas rainfall was above average for the most part of the Sahel. The investigation of the Sahelian rainfall for the individual months reveals that July was dry, followed by a wet August and September. It will be demonstrated that in July the African Easterly Jet (AEJ) was much weaker than in August and September, associated with a reduced AEW activity south of the AEJ in this month. The SL statistics display, on the one hand, a shift of the tracks to the north in July and August but, on the other hand, a much lower number in July, when compared to the wet August and September months. Additionally, several SLs occur east of 10°E in August and September resulting in positive rainfall anomalies in this region. Furthermore, a statistic of the relationship between the wave phase and the life cycle of SLs will be presented.