



Case studies of extra-tropically forced rainfall events during the AMMA SOP year 2006

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The monsoonal climate of southern West Africa is characterized by a distinct rainy season during the boreal summer half-year. Rainfall during the winter months November to March is usually quite rare and thus long-term January mean precipitation around 10°N ranges between 1 and 5 mm. At this latitude, intermittent squall-type rains characterize the March through May period before they are replaced by more regular “monsoon” rains in late June. The causes of this dry-season and pre-monsoon rainfall events are understudied, even though they have important socio-economic implications. Their dynamics is related to a subtropical upper-level trough, that penetrates from the subtropics deep into the tropics. Frequently, the eastern flank of the trough is associated with a band of high and mid-level clouds, a so-called Tropical Plume (TP).

The investigation presented extends on considerable published work of the authors on TPs and related Tropical Extratropical Interactions (TEI), but benefits from the enhanced and better atmospheric data sets available through the AMMA (African Monsoon Multidisciplinary Analysis) Special Observing Period (SOP), that took place in the year of 2006. Preliminary investigations have identified 25 TP events and three TEI events without recognizable TPs over West Africa. The results presented will focus on the dynamic causes of precipitation and its geographic location with respect to the TP, the response of the heat low to the upper-level subtropical trough, and subtropical cyclogenesis. Moreover, the 2006 will be compared to TP and TEI cases in 2002 and 2004.