



Interactions between intraseasonal variability of convection in the African summer monsoon and weather regimes over Europe

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The intra-seasonal time scale variability of rainfall and convection in the African monsoon has been investigated in the recent past years, highlighting the importance of 10-25 and 25-90 periodicities in rainfall and convective activity over West and Central Africa during the summer. Two independent modes of variability have been detected in the 10-25-day range. The first one is characterized by a stationary and uniform modulation of convection within the African ITCZ. It is associated with a modulation of the zonal low-level wind over the equatorial Atlantic and a zonal dipole of convection between Africa and the north equatorial Atlantic off the coast of South America. The second one is a westward propagating signal from eastern Africa to the western tropical Atlantic, with highest signal over the Sahel. At the 25-90-day range the highest mode of convection modulation is characterized by a uniform modulation of convection within the African ITCZ whose northern part shows a westward propagation over the Sahel. This mode is clearly associated with the Madden-Julian Oscillation activity over the Indian sector.

In this study we have investigated the relationships between these three intraseasonal time scale variability modes of convection and the 500 hPa geopotential fields through the use of the classification into the four main weather regimes defined over Europe in summer. Lagged composite analysis of the occurrence of these weather regimes and SVD computations have been performed over the period 1979-2007 to detect possible

two-way interactions between mid-latitudes circulation and the African monsoon. Atmospheric GCM simulations nudged over Africa have also been examined to test the possible impact of the African convection activity on mid-latitudes circulation.