



The summer northern african circulation: a global perspective

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During the summer season, the West African climate features a strong monsoon flow, which, at zero order, could be characterized by a meridional-height cross section, and an African Easterly Jet (AEJ) peaking at 600-700 hPa, on whose flanks important synoptic systems (African Easterly Waves, AEW) develop and determine consistent part of the precipitation in the area. All this complex system is characterized by time variability ranging from intra-seasonal to inter-decadal.

The purpose of this study is to analyze the most relevant variability patterns of the AEJ in connection with the meridional cells developing over West and North Africa, ranging from intra-seasonal to decadal time scales.

In order to study the association between the meridional circulation over the North African and the low tropospheric flow, we used daily wind speed data at 700 hPa, as representative of the AEJ variability, and the daily omega vertical velocity data, as a good fingerprint for the convection and in turn for the meridional overturning (data from NCEP-NCAR reanalysis).

To examine the statistical relationship between these fields, we apply the Coupled Patterns Analysis (CPA) for the identification of coupled modes of variability between time series of two variables, based on the Singular Value Decomposition (SVD) of the cross-covariance matrix constructed from the set of vertical velocity and wind component data .

We intend also to analyze the large scale features statistically concomitant to the regional patterns of variability picked out.