

**Teleconnection of the West African Monsoon to the Mediterranean summer climate: statistical and dynamical analyses.**

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Shifts of the summertime West Africa monsoon are known to produce large changes in the regional circulation and surface effects such as rainfall, moisture, temperature and wind, at least as north as the central Sahara. Rainfall over the Sahel is, in particular, tightly connected to the monsoon regime.

Large shifts are due to the anomalous warming of the sea surface in the Guinea Gulf around the equator, which teleconnects to the Guinean coast and Sahel by means of both thermodynamic (increased evaporation and atmospheric moisture content and convergence and thus anomalous latent heating) and dynamical (reduced land/sea temperature gradient, southern shift of the inter-tropical convergence zone, modified flux convergence, anomalous rising/subsidence patterns) effects. The inter-annual fluctuations of the regional Hadley circulation, whose rising branch is located on average over the Sahel area, appears to be a sensitive and effective dynamical structure to produce teleconnections farther north.

Statistical analysis suggests a distinct effect of the regimes of the West Africa monsoon also to the central-western Mediterranean summer (July-August) climate (temperature, precipitation). In particular, the southward shift of the monsoon seems to be related with cooler and wetter conditions over central and western Mediterranean.

A conceptual/analytical model of the connection of the West Africa Hadley cell with summertime circulation regimes over the Mediterranean is presented and discussed.

Preliminary numerical simulations with the Regional Atmospheric Modeling System (RAMS), aimed at unveiling the detailed effects of the regimes of the West Africa monsoon, triggered by the sea surface temperature anomalies across the Guinea Gulf and the atmosphere-land surface interactions (mainly modulated by the soil moisture anomalies or precipitation recycling), to the summer Mediterranean climate, are also shown.

Obvious collateral results arise from the statistical, conceptual/analytic and numerical analyses, which concern the detailed understanding and description of the West Africa monsoon regimes, their precursors and interacting mechanisms.

**Tuesday II (Talk)**