



Mutual interaction between the West African Monsoon on the summer Mediterranean climate

M. GAETANI, M. BALDI, and G.A. DALU
IBIMET, CNR, ROME, Italy (m.gaetani@ibimet.cnr.it)

Many studies have shown that the West African Monsoon (WAM) is teleconnected with neighbouring regions, as the Mediterranean (Med) basin and the Tropical Atlantic, but also it is sensitive to the perturbations occurring even in remote regions, as the Indian sub-continent and the Tropical Pacific, these teleconnections being active on several time-scales, from intraseasonal to multidecadal. The WAM plays also an active role in the regional atmospheric circulation, inducing significant changes in rainfall, moisture, temperature, and wind distribution up to the North Africa.

Within this framework, recent works were focused on the teleconnection between WAM and Med. WAM is strengthened by the north-easterly advection of moisture from the Med Sea, and, since the subsiding monsoonal air often invades the Med, there is a 2-way interaction between WAM and Med summer circulation. We study these interactions, applying SVD analysis to global NCEP Reanalysis and to rainfall data from CMAP, during the extended monsoonal season from May to October, on interannual and on intraseasonal time-scale.

Dynamical features are explored using composite analysis, focusing on the role of this connection in the heat waves occurrence in the Med. We find that a strong WAM intensifies the Hadley meridional circulation, with a strengthening of the north Atlantic anticyclone and a weakening, even blocking, of the westerly flow in the Med. A deep inland penetration of WAM produces a northern shift of the Libyan anticyclone, with subsidence and high pressure affecting mainly the western Med. The positive feedback is due to the intensification of north-easterly flow from the eastern Med, which, reaching the Sahara desert, intensifies the intertropical front, favouring abundant monsoonal precipitation because of the added moist air.