



Mediterranean Oscillation Index

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Atmospheric circulation, commonly described by spatial patterns of sea level pressure (SLP) and their time evolution, is one of the most important driving forces of surface climate. Above northern hemisphere a very well known example is the North Atlantic Oscillation (NAO) with the corresponding North Atlantic Oscillation Index (NAOI) as its intensity in time. There have been evidences in the literature that NAO strongly influences the Mediterranean climate, but it is not the dominant circulation pattern in this region.

In this work, the regional circulation pattern named Mediterranean Oscillation (MO), and the corresponding Mediterranean Oscillation Index (MOI), are derived from the SLP data across extended Mediterranean region. The MO is related to the activity of cyclogenesis in the Mediterranean, mainly in the bay of Genoa. In the positive phase of MO, the cyclogenesis is anomalously intense while in the negative phase it is anomalously weak. The MOI and NAOI are highly correlated among themselves, as the passages of the cold fronts from the Atlantic, described by NAOI variability, are one of the triggers for the Mediterranean cyclogenesis.

The influence of MO and NAO to the Mediterranean climate was investigated. MOI and NAOI were correlated with the 2 m above ground air temperature (T2M) and precipitation (PRC) anomalies. In winter season, when the weather across Mediterranean is strongly influenced by synoptic scale phenomena, the correlations between MOI or NAOI and PRC or T2M anomalies are stronger as in the summer when the weather is highly affected by the convection, which is weakly related to the synoptic scale. The correlation between MOI and NAOI and PRC is negative above all Mediterranean region, suggesting that wetter conditions are related to the anomalously strong cyclogenesis. The correlation with T2M is positive above north-western part of the domain and negative above south-eastern part of the domain. In all cases, when the correla-

tions between NAOI and PRC or T2M anomalies are significant, they are stronger in case of using MOI than NAOI.