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## Sources of seasonal predictability in the Mediterranean

Seasonal predictions in the Mediterranean region have relevant socio economic implications, especially in the context of a changing climate. However, sources of predictability have not been extensively investigated at the seasonal scale in this region. To this aim, we explore potential sources of predictability using a weather regimes (WRs) framework.

In recent years there has been an increasing interest in studying WRs and in assessing the ability of the climate models in reproducing them, due to their importance in influencing regional weather patterns and possibly future regional changes in the climate state. WRs are defined as persistent atmospheric patterns that can last from a few days to two or three weeks. We compute them by decomposing daily 500 hPa geopotential height anomalies with the Empirical Orthogonal Functions (EOFs), restricting the analysis to four principal components to which a k-means clustering algorithm is applied.

Having identified four Mediterranean WRs (MWRs) for the winter (DJF) and five for the summer (JJA) seasons, we study the relationship between MWRs and their Euro-Atlantic counterparts as well as their impact on local temperature and precipitation anomalies.

We then explore potential sources of MWRs predictability looking at teleconnections with sea surface temperature (SST) and precipitation. In particular, we assess how SST and precipitation anomalies affect the MWRs frequencies both during the season and during the preceding months.

This study will provide insight on the potential sources of predictability of dominant weather regimes in the Mediterranean and on the ability of seasonal forecast systems in capturing the mechanisms leading to such predictability.

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