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Empirical model for seasonal forecasting over the Mediterranean

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One of MEDSCOPE project main objectives is to explore the mechanisms responsible for climate variability and predictability in the Mediterranean region, focusing in particular on those linked with predictable signals in the oceans or associated with land-atmosphere interaction processes. The better understanding of the climate predictability in the target region will be used to develop a process-oriented empirical forecasting system (EFS). A first version of this EFS is here presented. The system is based on multiple linear regression, using global climate indices (mainly global teleconnection patterns and indices based on sea surface temperatures, as well as ice and snowcover) as predictors and near surface temperature and accumulated precipitation as predictands. The system is implemented in a way that can be easily modified to include information from other predictors that should come as result of the ongoing experiments exploring predictability.
Given the extension of the area studied, its high complexity (both in orography and land-sea distribution) and its location, every zone is affected by different factors at different seasons. Consequently, the model makes use of different sets of predictors for every season and region. For setting up the model, relationships between predictands and predictors are explored for every season, checking linear correlation with approximately 25 global indices up to year in advance, and using moving averages from two to six months. Then for every season and region a handful of predictors are selected, trying to preserve smooth transition both in space and time, i.e. predictors for two neighboring regions or two consecutive seasons should partially match. The model runs every month providing three months forecasts. First verification results of this EFS compared with hindcasts from several dynamical seasonal forecasting systems are also presented.