



Large scale dynamics preconditioning heavy precipitating events over southern France: a multi-variate weather regimes approach

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Mediterranean autumn climate is marked by heavy precipitations events (HPEs). They may occur at independent moments of the season and often indicate large scale forcing conditions as it has been studied in Nuissier 2011. This study focus on climatological analysis, based on the refined reanalysis ERA-Interim from ECMWF, of all components of these large scale circulation (LSC) favoring the occurrence of such events. Among a wide range of physical parameters from the reanalysis, we select those which are assessed as highest potential predictors for linear generalized regression for a set of HPEs over southern France. Then, a classification is performed on the normalized principal components combined for all selected parameters which leads in multivariate weather regimes for the Mediterranean autumn climate. The number of clusters is discussed in the methodology. Some of these obtained weather patterns are worthful decribing the LSC identified in Nuissier, and further to detail sub-scenarios for distinct sub-regional areas for HPEs occurrence. The varied parameters used in the study are helpful to distinct dynamical from more physical aspects of the sub-scenarios. The significancy of the identified scenarios is discussed, and even their capacity to discriminate HPEs from non-HPEs situations.