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# Meteorological considerations and satellite retrievals in supporting to the assessment of local hydrologic homogeneity over Italy

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Regional frequency analysis is a useful tool for estimating precipitation quantiles more accurately than at-site frequency analysis, especially in the case of regions with a brief history of short-time rainfall records. Since the rainfalls with short duration are mainly due to convective phenomena, usually affecting areas of few square kilometers, the description of these events with traditional tools such as in-situ rain gauges is often incomplete and not exhaustive. Thus, the application of these datasets to the regional analysis typically provides unrealistic description of the event and large miscalculations of the return time, usually higher than observation. Therefore, in order to evaluate the possible regional homogeneity and improve the performance of hydrologic models the inference analysis of the regional climatic regimes is revealed a useful tool. Starting from the intense rainfall of 19 November 2013 over Southern Italy, we demonstrate that the synoptic meteorological situation well-matched with results of Gabriele & Chiaravalloti (2013a, 2013b) where the regional homogeneity has been calculated on the basis of different climate indexes such as Convective Available Potential Energy (CAPE) and the Q-vector Divergence (QD). In support to that analysis two different methodologies based on satellite microwave information have been applied: the Water vapor Strong Lines at 183 GHz (183-WSL) (Laviola and Levizzani, 2011) algorithm provides to define the precipitation patterns while the MicroWave Cloud Classification (MWCC) (Miglietta et al., 2013) characterizes the cloud type in terms of stratiform and convective. Although, this study is still in progress the current results clearly demonstrate that the Mediterranean storms move on a sort of “preferential trajectories” especially during the months September-November where the most intense convections have been found.

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