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Atmospheric circulation patterns associated to heavy precipitation in Romania

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Daily precipitation totals at 60 stations in Romania for the period 1961-2006 and various thresholds depending on season are used to define and select heavy precipitation events. Specific synoptic-scale atmospheric situations are responsible for such kind of extremes. We use principal component analysis (PCA) and clustering techniques to characterize the atmospheric circulation patterns associated to heavy precipitation during winter, spring summer and autumn, respectively. This approach enables synoptic classification of every heavy precipitation day, and construct their associated composite maps in the field of sea-level pressure, 700 and 500 hPa geopotential height of NCEP/NCAR reanalysis data set. The results, as weather charts associated to heavy precipitation, could help climatological analysis of the established atmospheric patterns and be a useful tool to assist meteorological models in heavy precipitation forecasting.