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Rainfall Characterization in Different Areas in Spain by the Stratiform Component

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Rainfall regimes can enclose a variety of types due to several factors: orography, local and mesoscale convective phenomena, synoptic systems and large scale circulation. An example can be found in Iberian Peninsula where areas with different rainfall features exist. The aim of this work is the characterization of distinct rainfall regions in Spain (inside Iberian Peninsula and Balearic Islands) regarding the precipitation stratiform component. The election of this type of precipitation is due to a higher relationship with a synoptic regime or large scale atmospheric circulation. One of the most influent patterns that characterize the large scale circulation in the Northern Hemispheric, especially in the general variability of meteorological phenomena over Iberian Peninsula, is the North Atlantic Oscillation Index (NAO).

To tackle this study, firstly, a cluster analysis has been applied to all the rain gage stations, joining them as their geographic situation and climatology, in order to obtain different sectors with similar properties. It has been used a monthly and seasonal cumulative precipitation criteria to divide all the stations into five groups, which define each of the regions. Then, a separation methodology has lead on to the results of convective and stratiform precipitation components that characterize every sector. This classification into precipitation components has been attained through an algorithm where a critical intensity is computed. Finally, a seasonal comparison between stratiform precipitation component and NAO index has been carried out during the winters because is the period of the year where the influence of NAO is higher over Iberian Peninsula. Consequently, it can be established a particular influence of this index on stratiform precipitation in the study area.

Database for this work has been an hourly precipitation series from 1998 to 2011 in 63 stations from AEMET distributed over the Spanish Zone in Iberian Peninsula and Balearic Islands. Preliminary results from this study highlight the correlation between the pattern index used (NAO) and stratiform precipitation in some of the analyzed areas.