

REGIMES DE TEMPO E PREVISÃO DE EXTREMOS DE PRECIPITAÇÃO NA IBÉRIA

Weather Regimes and Precipitation Extremes forecasting in Iberia

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SUMMARY

Large-scale North Atlantic European Weather Regimes links to local Precipitation Extremes in Iberia are estimated with the aim to extend the forecasting time range of episodes of the later. Maps displaying the strength of these links are provided, which may be used as a complementary tool to numerical deterministic forecasting.

The Iberian Peninsula is subjected to, at least, four Weather Regimes (WRs) characteristic of the North Atlantic-European (NAE: 90W-30E, 20N-80N) region. These regimes are estimated, here, by a 4-means Cluster Analysis of the projection of 1961-2000 daily series of 500 mb Geopotential Height onto a lower order dimensional basis obtained by Principal Component Analysis. These are the well known Blocking, Zonal or NAO+, Atlantic Ridge, and Greenland Anticyclonic regimes.

Several works have been published describing the relationship between large-scale circulation patterns and precipitation patterns in Portugal and Spain. The results of these works motivated us to further pursue the study of this relationship: we provide Iberian high-resolution spatial patterns of the links between Extreme Precipitation Episodes (EPEs) and NAE's WRs.

Iberian EPEs are characterised by bi-dimensional functions of Precipitation Intensity and Duration (in days).

WRs are estimated using ERA40 re-analyses, while Iberian EPEs are computed from high spatial resolution gridded “observed” datasets and station observations in Iberia.

The links between WRs and EPEs are statistically estimated using different methodologies, and the thermodynamical processes involved are discussed.

The obtained results are useful for EPE seasonal-to-interannual forecasting, and are also suggested as a complementary tool to (i) improve the reliability of synoptic numerical deterministic EPE forecasting, and/or (ii) extend the time range of these forecasts.

We note that, besides the regional applicability of the presented results, the methodology used here may be applied to other regions of the world provided that links between large-scale circulation and local weather are strong enough for forecasting purposes.

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