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Forecasting the weather
- ensemble techniques
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Verification of clustering properties of extreme daily temperatures in winter and summer using the extremal index in five downscaled climate models

J. A. López Díaz
Agencia Estatal de Meteorología, Spain (jlopezd@aemet.es)

The clustering properties of extreme daily temperature, both for observed series in 16 observatories over the Iberian Peninsula in Spain through 1961-1990 and for the simulated series generated by stastical downscaling with an analogue technique on the basis of five AR4 GCM's (ECHAM4, HadAM3, CGCM2), have been compared by means of the extremal index. This index measures the strength of the clustering and allows the automatic classification of the extreme events into different clusters or into inter-cluster events. The downscaling technique has been developed at AEMET and uses a step-by-step linear regression on the 150 synoptic analogues of each day.
In order to appraise the statistical differences regarding the clustering of extreme events a bootstrapping technique has been used, whereby synthetic cluster series for observations and models were generated and the standardised difference of the extremal index in observations and models was computed. This procedure has been applied both to the summer (Jul-Aug) and winter (Dic-Jan) extreme daily temperatures. One can see pretty coherent spatial patterns for each model, with significant differences between models in their degree of approximation to the observed clustering properties.

Key words: Extremes, Temperature, Cluster, Extremal Index, Downscaling