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Analysis of the relationship between the monthly temperatures and weather types in Iberian Peninsula

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In this study, the relationship between the atmospheric circulation and weather types and the monthly average maximum and minimum temperatures in the Iberian Peninsula is modeled (period 1950-2010).
The temperature data used were obtained from a high spatial resolution (10km x 10km) dataset (MOTEDAS dataset, Gonzalez-Hidalgo et al., 2015a). In addition, a dataset of Portuguese temperatures was used (obtained from the Portuguese Institute of Sea and Atmosphere). The weather type classification used was the one developed by Jenkinson and Collison, which was adapted for the Iberian Peninsula by Trigo and DaCamara (2000), using Sea Level Pressure data from NCAR/NCEP Reanalysis dataset (period 1951-2010).
The analysis of the behaviour of monthly temperatures based on the weather types was carried out using a stepwise regression procedure of type forward to estimate temperatures in each cell of the considered grid, for each month, and for both maximum and minimum monthly average temperatures.
The model selects the weather types that best estimate the temperatures. From the validation model it was obtained the error distribution in the time (months) and space (Iberian Peninsula). The results show that best estimations are obtained for minimum temperatures, during the winter months and in coastal areas.

González-Hidalgo J.C., Peña-Angulo D., Brunetti M., Cortesi, C. (2015a): MOTEDAS: a new monthly temperature database for mainland Spain and the trend in temperature (1951-2010). International Journal of Climatology 31, 715–731. DOI: 10.1002/joc.4298