Precipitation extremes in the Iberian Peninsula: an overview of the CLIPE project

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The main aims of the project "Climate change of precipitation extreme episodes in the Iberian Peninsula and its forcing mechanisms – CLIPE" are 1) to diagnose the climate change signal in the precipitation extremes over the Iberian Peninsula (IP) and 2) to identify the underlying physical mechanisms. For the first purpose, a multi-model ensemble of 25 Regional Climate Model (RCM) simulations, from the ENSEMBLES project, is used. These experiments were generated by 15 RCMs, driven by five General Circulation Models (GCMs) under both historic conditions (1951-2000) and SRES A1B scenario (2001-2100). In this project, daily precipitation and mean sea level pressure, for the periods 1961-1990 (recent past) and 2021-2100 (future), are used. Using the Standardised Precipitation Index (SPI) on a daily basis, a precipitation extreme is defined by the pair of threshold values (D_{min}, I_{min}), where D_{min} is the minimum number of consecutive days with daily SPI above the I_{min} value. For both past and future climates, a precipitation extreme of a specific type is then characterised by two variables: the number of episodes with a specific duration in days and the number of episodes with a specific mean intensity (SPI/duration). Climate change is also assessed by changes in their Probability Density Functions (PDFs), estimated at sectors representative of different precipitation regimes. Lastly, for the second objective of this project, links between precipitation and Circulation Weather Regimes (CWRs) are explored for both past and future climates. Acknowledgments: this work is supported by European Union Funds (FEDER/COMPETE - Operational Competitiveness Programme) and by national funds (FCT - Portuguese Foundation for Science and Technology) under the project CLIPE (PTDC/AAC-CLI/111733/2009).