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Precipitation analysis in ENSEMBLES

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ensemble of regional climate modelling simulations from the European framework project ENSEMBLES are compared across European sub-regions with observed daily precipitation from the European Climate Assessment dataset by characterising precipitation in terms of probability density functions (PDFs). Models that robustly describe the observations for the control period (1961-1990) in given regions are identified, based on the overlap of normalised PDFs. This is followed by a comparison of the difference between the scenario period (2071-2100) and the control period using the best models obtained. By using a metric quantifying the error over the entire PDF, we find a clearly marked increase in the contribution to the total precipitation from the more intensive events in the scenario period almost everywhere. We demonstrate that there is a detectable increase scaling with increased warming, making it a relative indicator of climate change level. Furthermore, the crossover point from moderate to more intense precipitation does not show any significant change which is in accordance with expectations assuming a simple analytical fit to the precipitation spectrum.