



An atmospheric water budget perspective of extreme rainy seasons

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When characterising regional or global climate, due to its implications for both local impacts and the environmental water cycle, rainfall is one of the most important atmospheric variables to be considered. For this reason, annual and seasonal trends of hourly to daily rainfall extremes have been an important object of climatological studies in the past. In the context of the project INTEXseas (An integrated weather-system perspective on the characteristics, dynamics and impacts of extreme seasons), funded by the European research council (ERC), extreme rainy seasons are introduced as a new concept in climate research.

In this study, an extreme rainy season is defined as an anomalously 90-days wet period experienced by a region. Using daily rainfall fields of multi-year global gridded datasets from reanalyses and climate simulations, we discuss the particularities of the identified extreme wet seasons in each region and we make a point on the relationship between the anomalously high seasonal averages and the number and nature of the extreme short-term weather events included in these averages. To gain an insight into the different aspects of extreme wet seasons in different regions of the world, our results are discussed also taking into consideration the amplitude of anomalies of the fields of the atmospheric water budget terms that contribute to rainfall, i.e. surface evaporation and the vertical integral of the horizontal moisture flux divergence.