P5.34 Multidecadal oscillations of rainfall extremes in Europe

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Many studies have anticipated a worldwide increase in the frequency and intensity of precipitation extremes and floods since the last decade(s). Natural variability by climate oscillations partly determines the observed evolution of precipitation extremes. Based on a technique for the identification and analysis of changes in extremes, this paper shows that precipitation extremes have oscillatory behaviour at multidecadal time scales. The analysis is based on a unique dataset of 108 years of 10 minutes precipitation intensities at Uccle (Brussels), not affected by instrumental changes. We also checked the consistency of the findings with long precipitation records at 989 stations across Europe. The past 100 years showed for Brussels and neighbouring regions higher rainfall quantiles for the 1910s, the 1950-1960s, and more recently during both winter and summer of the past 15 years. These conclusions were found consistent for all time scales varying from 10 minutes to the monthly scale. The increase/decrease in rainfall quantiles was due to an increase/decrease in the number of extreme precipitation events and by higher/lower precipitation intensity per event, where the first factor was found most important. The increases were found statistically significant at the 5% confidence level, and were found to be partly explained by persistence in atmospheric circulation patterns over the North Atlantic during periods of 10 to 15 years.