

**Title:** Frequency analysis of precipitation amounts

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**Abstract:** This thesis deals with analysing characteristics of mean and extreme precipitation in observations and regional climate models (RCMs) with respect to their convective and stratiform origin. An algorithm for subdivision of precipitation amounts into predominantly convective and stratiform using station weather data is proposed and evaluated. The time series of convective and stratiform precipitation from the Czech Republic over 1982–2010 are used for analysing basic climatological characteristics of precipitation, including extremes, and evaluating RCMs from the ENSEMBLES project. Projected changes of convective and stratiform precipitation in Central Europe (the Czech Republic) are analysed using data from RCM simulations from the EURO-CORDEX project. The last part of the thesis introduces a new statistical model for analysing precipitation extremes. This model takes advantage from knowledge of origin of precipitation extremes. In future climate we could expect more convective and stratiform precipitation amounts in all seasons except summer, when climate models project decline in amounts of stratiform precipitation. Extreme precipitation is projected to increase for both convective and stratiform precipitation, and more extremes are expected with a larger increase of temperature. An increasing proportion of convective precipitation in summer and generally growing intensity of precipitation may have important implications for soil erosion and occurrence of flash floods.

**Keywords:** convective precipitation, stratiform precipitation, regional climate models, extremes, Central Europe