



## **Spatial dependence of intense rainfall and floods**

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The spatial and temporal extent of precipitation events has a crucial influence on the magnitude of floods. The dependence of extremes measured at different sites is often described with the tail dependence of the corresponding bi-variate copulas. However tail dependence describes a bivariate property and cannot describe the multivariate dependence of high intensity rainfall properly. Further depending on the spatial scale of investigated region areal extremes might be caused by events which are not extreme for individual sites. Multivariate measures to indicate systematic departures from the bi-variate marginals are introduced. Further precipitation events are classified according to the corresponding atmospheric conditions allowing specific treatment of extremes on different scales. The methodology is illustrated using a great number of daily precipitation stations in South-West Germany.