Spatial interpolation of IDF-curves for precipitation in Belgium

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The Intensity-Duration-Frequency (IDF) curves for precipitation constitute a relationship between the intensity, the duration and the frequency of rainfall amounts. The intensity of precipitation is expressed in mm/h, the duration or aggregation time is the length of the interval considered while the frequency stands for the probability of occurrence of the event. IDF-curves constitute a classical and useful tool that is primarily used to dimension hydraulic structures in general, as e.g., sewer systems and which are consequently used to assess the risk of inundation. In this presentation, the IDF relation for precipitation is studied for different locations in Belgium. These locations correspond to two long-term, high-quality precipitation networks of the RMIB: (a) the daily precipitation depths of the climatological network (more than 200 stations, 1951-2001 baseline period); (b) the high-frequency 10-minutes precipitation depths of the hydrometeorological network (more than 30 stations, 15 to 33 years baseline period). For the station of Uccle, an uninterrupted time-series of more than one hundred years of 10-minutes rainfall data is available. Different types of extreme distributions are compared as well as two types of methodologies (annual maxima and Peak-Over-Threshold). Adequate spatial interpolation techniques are used to provide nationwide extreme values precipitation depths for short- to long-term durations with a given return period. These values are estimated on the grid points of the Belgian ALADIN-domain used in the operational weather forecasts at the RMIB. A special attention has been focused on the calculation of adequate confidence intervals.