



Fine-scale Characteristics of Rainfall in Beijing Urban Area Based on A High-density Autonomous Weather Stations (AWS) Dataset

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Abstract: On the basis of a quality controlled hourly rainfall dataset from autonomous weather stations (AWS) for the past 8 years (2007–2014), the general and fine-scale characteristics of rainfall in Beijing were analyzed. Results show that there are two high rainfall centers in all area of Beijing. The urban heat island has an important effect on rainfall events. The rainfall events distribute unevenly both on seasonal scale and on daily scale. The study also found that the influence of urban heat island on rainfall events is different among different seasons. Events with high values of rainfall and 1–3 h and 4–6 h durations in the summer largely occur over central and northeastern Beijing, where the urban heat island has significant influences. However, there are fewer events of low rainfall with 6- h and longer duration in urban area in the summer. The features of rainfall distributions in the spring and autumn are opposite to that in the summer. Differences in diurnal variations of rainfall in different seasons are distinguished. The diurnal variation of precipitation displays a two-peak feature in the spring and autumn, while it only shows a single peak in the summer. These features are in accordance with the distributions of occurrence time of maximum rainfall amount over Beijing.

Keywords Rainfall events, Hourly rainfall dataset, Fine-scale characteristics, Seasonal