



Hydrological responses to small scale rainfall variability over a semi-urban catchment using Multi-Hydro model: C-band vs. X-band radar data

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The increasing urbanization of cities has been a reality all over the world. As a result, improving the ability to handle extreme rainfall events and managing flood risks is becoming more urgent. In support of this task, data from high-tech weather radars, which have the unique ability to spatio-temporally estimate rainfall fields, have been used in hydrological models.

In this work, the case study of Guyancourt (France) will be analysed. It is a semi-urban area of approximately 5.2 km² in the southwest of Paris, located at the Saclay Plateau. Nevertheless, a big project (called Paris-Saclay) has been registered in the framework of a national operation to concentrate 20% of the country's research activity and leading companies in this area to make it the "French Silicon Valley". Many protests have taken place by defenders of agricultural lands and associations who fear the impacts of urbanization.

In this purpose, the fully-distributed hydrological model Multi-Hydro (developed at École des Ponts Paris-Tech, hmco.enpc.fr) was used with weather radar data to analyse the impacts of the Guyancourt's urbanization (in the framework of the cited project) and of the small-scale spatio-temporal rainfall variability on the simulated hydrographs. Two different rainfall data were used for three selected events: the Météo-France C-band radar data and the high-resolution ENPC X-band radar data. The obtained results demonstrate the contribution of better spatio-temporal resolution (X-band radar) data, which are able to point out some important peaks in the simulated hydrographs, unnoticed while using C-band radar data.