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## Complementing urban rainfall/flood monitoring using low-cost citizen observatories: first result and challenges

**Boud Verbeiren**<sup>1,2</sup>, Kim Tondeur<sup>1</sup>, Solomon Seyoum<sup>1</sup>, and David Pireaux<sup>2</sup>

<sup>1</sup>Vrije Universiteit Brussel, Hydrology and Hydraulic Engineering, Brussels, Belgium

<sup>2</sup>Brussels Company for Water Management (SBGE/BMWB), Direction Exploitation, Brussels, Belgium

Internet-of-Things (IoT) technology is evolving rapidly and within the frame of the FloodCitiSense.eu project we are exploring the potential of low-cost citizen observatories for the monitoring of intense rainfall and pluvial flooding in three pilot cities: Brussels, Rotterdam and Birmingham. In this presentation we focus on the Brussels pilot in which we evaluate the added value of low-cost rainfall sensors (developed by Disdrometrics, Delft – The Netherlands) to complement the existing network with 16 professional rain gauge (Flowbru.be – Open data). The main objective is to obtain a higher density of rainfall measurements enabling to capture, in near real-time, intense rainfall events. Due to the high degree of imperviousness of the city landscape intense rainfall is often the trigger for a fast hydrological response, sometimes causing pluvial flooding in Brussels. The low-cost rainfall sensors are disdrometers, counting the number and estimating the size of raindrops. The low-cost sensors make use of LoRa technology to send their data in near real-time to the central database. In Brussels 20 low-cost sensors were installed with help of citizens, mainly aiming at filling the “gaps” of the existing rain gauge network. To enable direct evaluation some of the low-cost sensors were installed next to professional rain gauges. We evaluate the performance of the low-cost sensor by (1) direct comparison (intensity and volumes) with the professional rain gauges of the Flowbru.be network, (2) comparing the spatial pattern of measured rainfall intensities, with and without low-cost sensors, to radar rainfall maps and (3) the reliability of the low-cost measurements. In this contribution we will focus on the first results from the test phase (October 2019 – January 2020). Next we also elaborate on the challenges involved in the deployment of a network of low-cost sensors. The FloodCitiSense.eu project is a close collaboration with TU Delft, Imperial College London, IIASA, Disdrometrics, VUB SMIT-imec, LGiU, EGEB and is funded within the ERA-NET Smart Urban Future programme (Urban Europe ENSUF).