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Assessing the quality of citizen-science rainfall data based on station setup

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The *Delft Measures Rain* Citizen-Science programme has been running for several years in the city of Delft, the Netherlands. Within this programme, interested citizens can apply to receive a low-cost Alecto WS5500 weather station, to measure local meteorological parameters in their own garden. Currently there are over 45 of these citizen-science weather stations spread across neighbourhoods in Delft, capturing rainfall variability in different urban microclimates. However, the scientific quality of these specific stations has never been tested, and from previous work we know that rigorous quality assurance is necessary in order to get meaningful (precipitation) data. Thus we have installed 8 Alecto stations in The Green Village outdoors urban climate field lab at the TU Delft. Stations have been explicitly installed in ways that a citizen might do: slightly tilted, next to a wall (simulating the limited open garden space of a Dutch urban residence), on top of a shed as well as free-standing. These different measurement setups, combined with a row of stations installed in the same way right next to one another, allow us to investigate the bias caused by less-than-ideal station installation, as well as systematic errors related to the tipping bucket mechanism and sensor drifts. Initial results show a general overestimation of the Alecto compared to reference stations and radar observations, and a discernible negative bias caused by sheltering effects of plants and, to a lesser extent by walls.