



## **Don't trust a rain gauge. Trust three of them.**

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Despite the existence of advanced precipitation remote sensing techniques - using radar, microwave links or satellites - rain gauges still provide what is considered to be the truth about rainfall. However, rain gauges are prone to errors themselves. In particular failures of the mechanics and electronics or blockage due to debris, can cause large biases and data gaps. That is, a single gauge cannot be trusted. Hence we have investigated the use of multiple gauges at one location.

In summer 2015 the KIT Campus Alpin carried out the intensive measurements campaign *ScaleX* to investigate atmospheric, hydrologic and biogeochemical processes over a large range of scales. For the observation of the high spatio-temporal variability of rainfall, we have installed a dense network of 22 rain gauge sites, each equipped with three equal tipping buckets. Five sites have a spacing of 250 m and cover the area of our wireless soil moisture network. The remaining 17 sites have a spacing of approximately 2.5 km and cover our target catchment with a size of 70 km<sup>2</sup>.

Using the redundancy provided by the three equal gauges per site, we are able to easily identify failing rain gauges automatically. This results in a high data availability at the gauge sites and very reliable high resolution spatial rainfall information which will be used by the accompanying *ScaleX* modeling of soil moisture and streamflow.

We will show the advantages of having redundant information on each rain gauge site and describe our automated processing of this information. Furthermore we will present analyses of the spatial decorrelation of rainfall using the rain gauge network and additional polarimetric weather radar data.