



Gauging Flash-Floods: Automated Measurement of Flood Events in Mountain Torrents

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Rating curves contain uncertainties, especially in their upper range of higher discharge. This is due to more uncertainties in the measurements and also the typically lower number of measurements of high discharge events. However, it is the upper part of a rating curve that is of interest if it comes to dimensioning protection measures against floods and flash floods. For small municipalities who plan mitigation measures like a dam for protection against flash floods of small mountain torrent a rating curve as accurate as possible can be of great interest. It helps to reduce costs that can be caused by both under- and overdimensioning of a protective structure.

We therefore invented a mobile discharge measurement station that is set up to construct a rating curve for small turbulent mountain torrents. It operates with salt dilution method and works in its current setup up to about 10 m³/s. The salt is injected automatically to the torrent when an event of desired magnitude takes place. Further downstream a conductivity measuring sensor records the change in salt concentration of the stream water. This mechanism is guided by automatic continuous observation of radar quantitative precipitation estimates (QPE) and a water pressure sensor. Measurements at a first test site gave promising results. The system does event measurements independent of the time of day and day of the week. The measuring equipment at the field site is only activated in case of an event. Therefore it has a low power consumption and can be run by only two solar panels.