



Measurement of discharge by the ultrasonic (transit-time) method in “degraded mode” using computational fluid dynamics and data analysis

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ABSTRACT

This study proposes a computational fluid dynamics and data analysis based methodology to determine the discharge using ultrasonic (transit-time) gauging stations in degraded mode (when one or several paths are not working). This methodology is presented through two applications: the gauging stations *Milan* and *Quai Forst* in Mulhouse city, France. A data analysis is carried out to determine the degraded relationships for missing velocities. Results highlight the very practical potential of this approach in real-life conditions. Our message is not to say that some paths are useless; all of them are necessary for an accurate determination of the discharge. But, when some data are missing, instead of losing the whole discharge information, the proposed methodology can be used to determine the discharge with a limited additional error.

KEYWORDS

Sewer networks, discharge measurement, transit-time, computational fluid dynamics, data analysis, degraded conditions