



## **Distributed measurement of flow rate in conduits using heated fiber optic distributed temperature sensing**

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In some cases flow varies along conduits, such as in irrigated land drainage pipes and channels, irrigation laterals and others. Detailed knowledge of flow rate along the conduit makes possible analytical evaluation of water distribution and collection systems performance. Flow rate can change continuously in some systems, like in drainage pipes and channels, or abruptly, like in conduits bifurcations or emitter insertions. A heat pulse along the conduit makes possible to get flow rate from continuity and heat balance equations. Due to the great value of specific heat of water, temperature changes along conduit are smaller than the noise that involves the measurement process. This work presents a methodology that, dealing with the noise of distributed temperature measurements, leads to flow rate determination along pressurized pipes or open channel flows.