Improved modelling of intermittent water supply systems

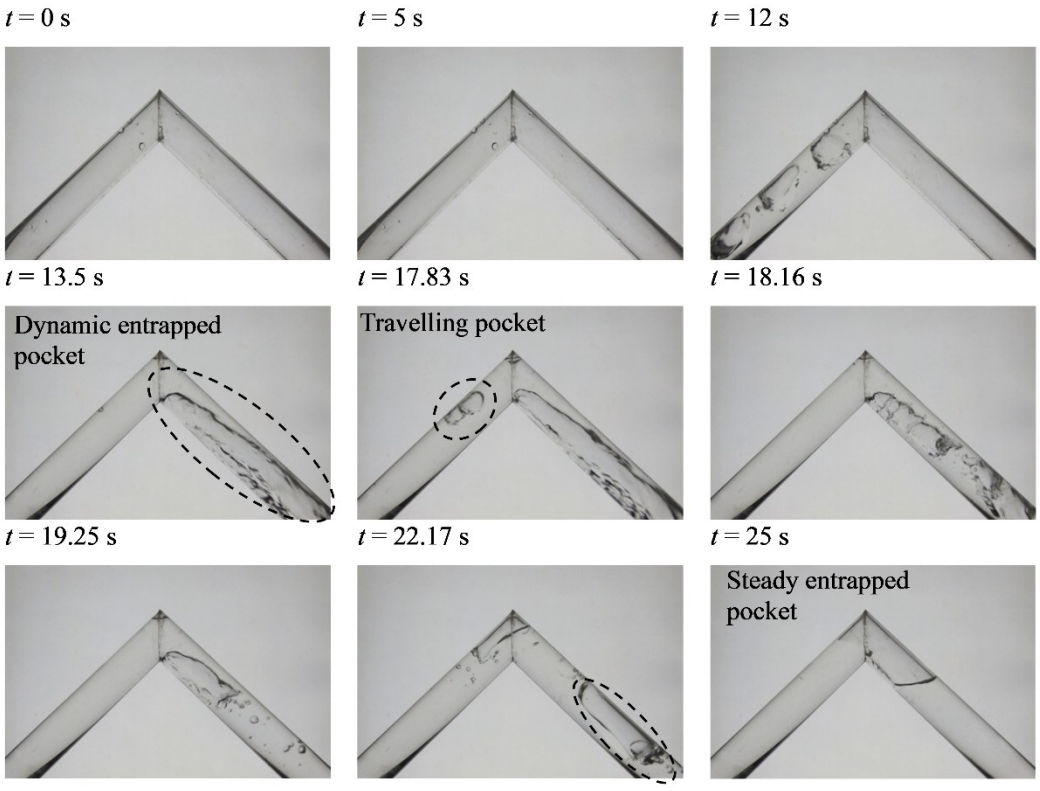
Summary

Intermittent water supply (IWS) systems provide water to over 1.3 billion people in developing countries. IWS is classified from predictable, regular to unreliable with interruptions that vary from hours to days. Utilities are unable to improve the inadequate levels of service, given their typical emptying-filling decline cycles. Existing IWS models are largely designed for continuous water supply but are operated intermittently, hence unable to predict IWS phenomena. This project aim is to develop a new modelling approach for the operation and management improvement of IWS systems and the design of transition pathways to CWS.

The methodology includes the development, calibration and validation of a novel hydraulic modelling approach which will allow the simulation of the pipe filling events in IWS operation. The model provides a detailed description of the pressurisation of IWS systems during the filling process and the entrapment of air pockets in single and looped systems. The research includes numerical modelling, experimental analysis and testing in a full-scale system. Results allow establishing recommendations for designing and operating IWS.

Keywords

Intermittent water supply, numerical modelling, pipe filling, pipe emptying, entrapped air.



Entrapped air pocket creation during pipe filling events.

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