

Parallel Jets Emerging From Two Parallel Gates: Distinguishing Flow Condition

M Bijankhan

Benjamin Dewals

S Kouchakzadeh

Sébastien Erpicum

G Belaud

Pierre Archambeau

Michel Pirotton

Abstract

From the practical point of view, it is usual to install two or more gates in parallel in wide channels. Although it is a very common circumstance in the irrigation networks, there are very few studies to investigate the flow through parallel gates. In this study, two gates installed in parallel were considered. Experiments were then performed to investigate the flow regimes at the downstream of the structure. It was found that for the parallel jets with different discharges as differential opening increased, the gates would be more sensitive to be submerged. This pointed out the role of the interaction between jets, involving momentum exchange and modifications of roller structure. Highly non-uniform velocity distribution was observed by the ADV measurements at the downstream of the parallel gates with a closed side. Also, it was experimentally indicated that when one of the gates was kept closed the tailwater depth value associated with the submergence threshold would depend on the tailwater measuring location from the gate significantly.

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