

Numerical Solution of 1-D Shallow Water Equations at Junction for Sub-Critical and Super-Critical Flow

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Abstract : In this paper, we solve 1-D shallow water equation for sub-critical and super-critical water flow at junction. The water flow at junction has been studied for the last 50 years from the physical-hydraulic point of views and for numerical computations need more attention. For numerical simulation, we need to establish an inner boundary condition at the junction to avoid an oscillation which rise from the waves interactions at the junction. Indeed, we introduce a new boundary condition at the junction based on the mass conservation, total head, and the admissible wave relations between the flow parameters in the three branches to predict the water depths and discharges at the junction. These boundary conditions are valid for sub-critical flow and super-critical flow.

Keywords : numerical simulation, junction flow, sub-critical flow, super-critical flow

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