Experimental and numerical investigations of flow through free double baffled gates

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Abstract

Studying the flow patterns and behaviour of double baffled gates under different flow heads is important to improve their performance, which could help in widening the range of their application. In the present study, physical and numerical investigations were conducted on the double baffled gate. A 3D Acoustic Doppler Velocity Meter (ADV) was used for laboratory measurements of the instantaneous velocity fields in the physical gate model. In parallel with this, the CFD Fluent package was adopted to carry out a sensitivity analysis for a matrix of geometric parameters of the double baffled gate. The outcomes of the laboratory and CFD numerical investigations were incorporated in a spreadsheet with the purpose of informing the design of double baffled gates under conditions of non-submergence.

Keywords: Control structures, irrigation, baffled gates, computational fluid dynamics, Fluent