

Study on flow below sluice gate in irrigation systems

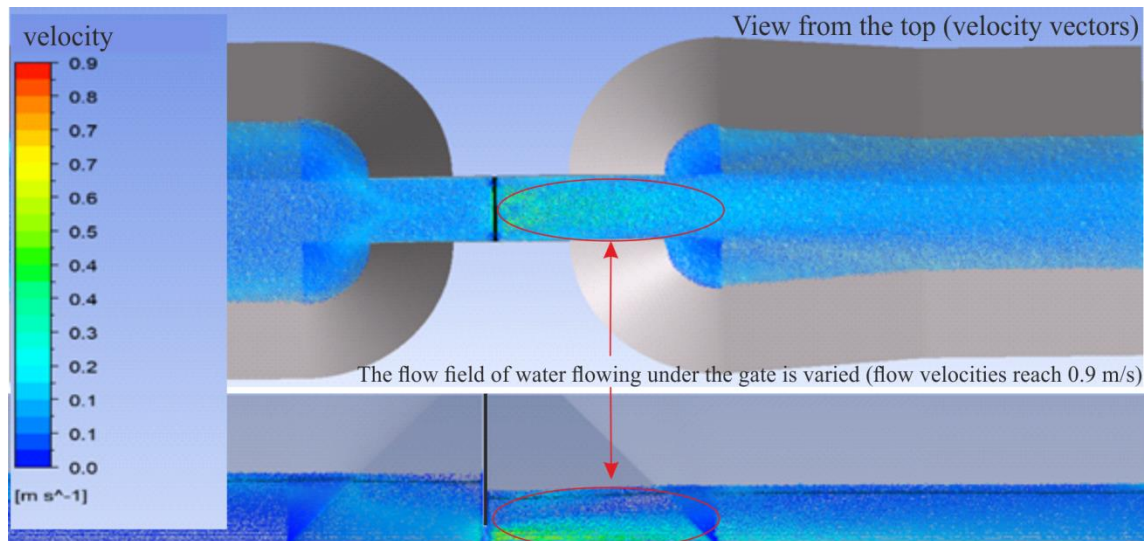
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ABSTRACT

Vertical sluice gates are often used in irrigation systems. Flow conditions below such gates are however different from those for a typical sluice gate, analysed in various hydraulic studies, because of a side contraction, non-uniform roughness and seasonal changes in the conductivity of the channel at the inflow and outflow. Using such devices to control a flow rate, requires additional analyses of methods and location points for water level measurements below the gate and also assessing its discharge characteristic. Flow conditions upstream and downstream the irrigation sluice gate were analysed using physical and numerical modelling. The second approach was based on the Computational Fluid Dynamics (CFD) with Reynold Averaged Navier-Stokes equations (RANS) (Fig.1). Such models allow to simulate a turbulent flow in channels of a complex geometry. Obtained numerical results were compared with laboratory measurement.



The CFD results are very similar to measured values

Fig. 1. Flow field visualization for $Q_{min} = 0.0149 \text{ m}^3/\text{s}$.