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Velocity Distribution in Open Channels with Sand: An Experimental Study

Authors : E. Keramaris

Abstract : In this study, laboratory experiments in open channel flows over a sand bed were conducted. A porous bed (sand bed) with porosity of ε=0.70 and porous thickness of s´=3 cm was tested. Vertical distributions of velocity were evaluated by using a two-dimensional (2D) Particle Image Velocimetry (PIV). Velocity profiles are measured above the impermeable bed and above the sand bed for the same different total water heights (h= 6, 8, 10 and 12 cm) and for the same slope S=1.5. Measurements of mean velocity indicate the effects of the bed material used (sand bed) on the flow characteristics (Velocity distribution and Reynolds number) in comparison with those above the impermeable bed.

Keywords : particle image velocimetry, sand bed, velocity distribution, Reynolds number
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