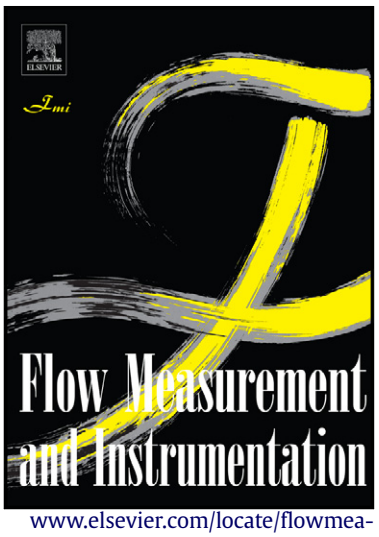

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Investigation of flow characteristics above trapezoidal broad-crested weirs

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Abstract

In this study the effect of upstream face slope of a trapezoidal broad-crested weir on discharge coefficient and water surface profile was investigated using the laboratory models. The velocity and pressure distribution profile were determined. The location of the critical section above the weir was specified. The dimensions of flow separation zone were also measured for different upstream face slopes. The results showed that decreasing the upstream face slope prevents development of separation zone. In this case, the flow was passed through the weir more regularly and the water surface and pressure drop were decreased. Decreasing the upstream face slope to 21^0, increased the discharge coefficient up to 10% and reduced the separation relative length and height up to 80% and 95% respectively.

Keywords: Trapezoidal Broad-Crested Weir, Discharge Coefficient, Flow Separation, Velocity Profile, Critical Depth.

1- Introduction