Comparison of Measured Discharges of Designed Trapezoidal Modified Broad Crested Weirs and Estimated Discharge by Winflume Software

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ABSTRACT

Growing populations induces the more withdrawal of water towards agriculture, industry and domestic putting water resources under stress. Good management of scarce water resource is dependent upon quantifying supplies and uses with accurate measurement techniques. Several types of structures have been used for finding discharges in open channel. The terms ''long-throated flume'' and 'broad-crested weir'' comprises a large family of structures used to measure discharge in open channels with highest accuracy. The advantages of this structure include minimal head loss, low construction cost, adaptability to a variety of channel types, and ability to measure wide ranges of flows with custom-designed structures. The WinFlume program serves two primary purposes Calibration of existing flow measurement structures fitting the criteria for analysis as long-throated flumes and Design of new structures. In the present study, the Winflume is used to test existing design. A good correlation is established between the measured and predicted discharges With improving the upstream conditions, the measured and theoretical discharges are in good agreement with best coefficient of determination. The difference between the theoretical and measured discharges varied between 9.81 % to -1.87 for different flumes at different discharges. With modification the average percent of error in case of broad crested weir is – 1.669 and is decreased to -1.005% by using WinFlume software. From the results it is clear that the model has good ability for estimation of the passing discharge through the long throated flume, therefore it can be used successfully to simulate hydraulic process of passing discharge through the long throated flume.

Key words: *Comparison, Crested weirs, Winflume software.*