

Comparison Between Numerical Flow3d Software and Laboratory Data, For Sediment Incipient Motion.

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Abstract

In this paper, the laboratory data were compared with computational fluid dynamics (CFD) Flow3D for predicting the beginning of sediment incipient motion in rigid boundary channel for two types of sands, irrigation, and sewer types, in rectangular flume (0.5*0.5)m cross section. Tests were made for soil samples with different diameters, specific weights. The testing was performed in slopes ranging from 0.001-0.003 for irrigation types and 0.0025-0.025 for sewer types depending on the original parameter. The Flow-3D software has simulated the laboratory work using scouring models MPM and Nielsen. the relation between sediment incipient motion velocity, particle size, and channel bed slope was predicted. The results were relatively more than laboratory data for the MPM model, while grating convergence for Nielsen model, especially for small diameter sediment. Also, the laboratory results are more close to the results of Flow3D using the Nielsen model when the value of bed slope of the channel is greater, and vice versa when the slope decreases.