Velocity Field Masking Technique for Coastal Engineering Experiments

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Abstract

Since the development of Bubble Image Velocimetry (BIV) technique as the complementary technique of Particle Image Velocimetry (PIV), the application of digital imaging technique in the field of hydraulic and coastal engineering increased rapidly. BIV works very well in multi-phase flow (air-water) flows where the PIV technique doesn't. However, the velocity field obtained from BIV technique often resulted in a velocity vector on the outside of the flow (false velocity) since the Field of View (FOV) usually not only cover the air-water flow but also the area outside the flow.

In this study, a simple technique of post processing velocity field was developed. This technique works based on the average of the pixel value in the interrogation area. An image of multi-phase flow of wave overtopping was obtained through physical experiment using BIV technique. The velocity calculation was performed based on the similar method in PIV. A velocity masking technique developed in this study then applied to remove the false velocity vector. Result from non-masking, manually removed and auto removed false velocity vector were presented. The masking technique show a similar result as manually removed velocity vector.

This method could apply in a large number of velocity field which is could increase the velocity map post-processing time.

Keywords : Bubble Image Velocimetry, Multi-phase flow, Velocity field

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