Roughness Coefficient and Shear Velocity Caused by Group Groyne

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Morphology and environmental system emerged as important factors governing the river's soundness in these days. To improve fluvial function and ecological function of a river, many researches on designing of river training structure, such as groynes, have been conducted. Most of the recent researches on river training structures are focused on flow characteristics around the single groyne. However researches on a group groyne, mostly used for river training in a field, are not being conducted as much as engineers' desires.

In this research, estimation method of the representative hydraulic characteristics, such as flow resistance and shear velocity of group groyne were developed. The representative values will allow 1-D numerical simulation instead of 2-D or 3-D numerical analysis, which requires tedious data prepare process and laborious efforts. The hydraulic characteristics along group groyne were measured from experimental models of serial river-transverse structures. As the result, roughness coefficient and shear velocity (U*), which governs the flow and scouring, were appeared to be a function of not only Reynolds number (Re) but also interval ratio (w/k) and overflow ratio (h/k) of groynes. Moreover, for the same overflow ratio, Re and U/U* decreased as interval ratio increased. However, there was no significant effect on the interval change when overflow ratio was less than or equal to 1.7. In all, the paper provides elementary data for the design of serial river-transverse structures by showing the relation between interval ratio and overflow ratio and the relation between Reynolds No. and U/U* in one graph.

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