

Comprehensive Experimental Study to Determine Energy Dissipation of Nappe Flows on Stepped Chutes

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Abstract : This study has investigated the fundamental parameters which have effective role on energy dissipation of nappe flows on stepped chutes in order to estimate an empirical relationship using dimensional analysis. To gain this goal, comprehensive experimental study on some large-scale physical models with various step geometries, slopes, discharges, etc. were carried out. For all models, hydraulic parameters such as velocity, pressure, water depth, flow regime and etc. were measured precisely. The effective parameters, then, could be determined by analysis of experimental data. Finally, a dimensional analysis was done in order to estimate an empirical relationship for evaluation of energy dissipation of nappe flows on stepped chutes. Because of using the large-scale physical models in this study, the empirical relationship is in very good agreement with the experimental results.

Keywords : nappe flow, energy dissipation, stepped chute, dimensional analysis

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