Numerical approach of the computational point of inception in stepped channels

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Description
We present a numerical model of the two dimensional flow boundary layer in stepped channels with steep slope, which is based on the finite differences scheme. From the mass and linear momentum conservation equations taking into account characters of the boundary layer, a system of non linear equations governing the flow has been developed. Macro roughness effect has been introduced by the presence of step along the channel features out-flow and considered as limit condition of the model. A discrete the system of equations has been obtained, by allowing to calculate the velocity profile, the boundary layer thickness and position of the inception of air entrainment. The latter has been determined as intersection between the boundary layer and the free surface. The results intense of inception point have been found close to experimental data on the scale model spillway raw of M'Bali.Original Abstract: Une …