Abstract

In this study, the flow routing in sloping channels acting as a principal flow control has been analyzed. The main focus of the research is characterized by the study of one dimensional system. A state of the art review of transient flow routing, the theoretical development of the main models for high slope channels without backwater effects, the numerical scheme representation, and the application in cases with theoretical solution are presented. In this study a numerical method based in the kinematic wave routing is developed to solve the Saint-Venant equations for high slope conditions. In this case, the method of characteristics is particularly suitable for the representation of the solution with high slope condition. A previous validation of the theoretical model shows that if a shock wave can be generated in a river, the complete Saint-Venant equations are not valid near to the discontinuity. As a result, the weak solutions theory and the use of the method of characteristics allow defining a mathematical model that can be approximated to the physical reality of the phenomenon.

Keywords