Contribution ID: **149** Type: **Poster Presenter**

River flow dynamics with non-linear shallow-water equations

This research proposes a model that is able to approximate unsteady flows in rivers and simulate the associated riverine processes to gain an understanding and insight into open-channel flow dynamics. The governing equations include Saint-Venant equations. Second-order temporal and spatial accuracy is obtained by TVD Runge-Kutta method and high resolution reconstruction techniques, respectively. The equations are solved by Godunov-type finite volume method which is preferred because of its conservation preserving characteristics. Approximate Riemann solver technique of Harten-Lax-van Leer (HLL) is used to compute flux components associated with hydrodynamics. A modified method for approximating flow features along shear wave is introduced. The proposed scheme is used to model an idealized dam-break case, and a case of dam-break in a channel with a 90o bend which results in bore formation and complex two-dimensional flow; the predictions show excellent agreement with available experimental results and analytical solutions.

Authors: Dr REHMAN, Khawar (GIK Institute of Engineering Sciences and Technology); MANDOKHAIL, Saeed (BUITEMS)

Presenter: MANDOKHAIL, Saeed (BUITEMS)

Track Classification: Civil & Construction Engineering