## عنوان مقاله:

Numerical Simulation of Unsteady One-Dimensional Dam-Break Flows Using TVD MacCormack Scheme

## محل انتشار:

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## خلاصه مقاله:

Dam break phenomenon is still of paramount important issue in the field of hydraulic engineering. Predicting the critical conditions due to dam-break flows indicates more field studies requirement. The MacCormack numerical scheme is a classical second order explicit scheme for the simulation of unsteady one-dimensional dam-break flows. It is well known that classical second order schemes show oscillatory behavior near discontinuities and can generate or maintain a shock in the solution. In this paper, the classical MacCormack scheme is presented and extended to a finite difference predictor-corrector TVD (Total Variation Diminishing) scheme by implementing a conservative dissipation term to the last step of classical version. MacCormack's scheme with and without TVD correction is used to simulate one-dimensional dam-break problem. The accuracy of the computed solutions are verified with an analytic solution and experimental data. It is found that using TVD scheme, any unphysical oscillation in the vicinity of strong gradients in the numerical solution is avoided. Furthermore this algorithm improved the performance of the MacCormack scheme and for the one- dimensional case, a satisfactory agreement between computed and experimental results obtained.

## کلمات کلیدی:

unsteady Dam-break flows, MacCormack scheme, Predictor-corrector TVD scheme, numerical simulation, One-dimensional