- **Comparison of solution of Saint-Venant equations by characteristics and finite difference methods for unsteady flow analysing in open channel**

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Abstract: The unsteady flow can be analyzed by Saint-Venant equations. These equations can be solved by characteristics and finite difference methods. The Saint-Venant equations are changed into four complete differential equations in characteristics method and these equation are solved by drawing two characteristics lines. The Saint-Venant equations are changed into a set non-linear equations and are solved using Preissman scheme in finite difference method. This set equation are changed into linear equation using Newton-Rafson method and can be solved using Sparce method. In this research, the results of the two method were compared and this was shown that 1) these two methods can draw the surface profiles and flow hydrograph as well, 2) the finite difference method is more accurate than that one, 3) the mesh size in finite difference method can be larger than that one, and 4) the difference between two methods are increased by increasing the time and distance.

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