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خلاصه مقاله:

The developing turbulent flow in an open channel is a complex three-dimensional flow influenced by the secondary currents and free surface effects and is, therefore, not amenable to analytical solution. This paper aims to study the impact of three key hydraulic parameters (relative roughness, the Froude number and the Reynolds number) on the establishment length using computational fluid dynamic (CFD) analysis. CFD analysis is based on the use of the ANSYS-CFX commercial code. The CFD strategy of modelling is validated against experimental velocity distribution in a cross-section and a good agreement is achieved. A dimensionless length is suggested for predicting the length of the developing flow zone for rectangular open channel. A linear relationship has also been developed for assessing the establishment length.

کلمات کلیدی:

Fully developed flow, Establishment length, Open channel flow, Numerical modelling, Velocity field

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/926443