

Numerical simulation of the effect of inflow Froude number on flow separation zone in junctions

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ABSTRACT:

Junctions are generally used in water distribution networks, irrigation channels, sewage networks, water/wastewater treatment facilities, input to power generation facilities, and etc. In this study, the flow numerical simulation has been performed in a 90° Junction using RSM turbulence model. Water surface and flow velocity profiles at different sections of the main and lateral channels were compared with the experimental results and a good agreement has been found between them. Then, considering the good results obtained from previous sections, Froude number effect of the main and lateral channels entrance on flow separation zone was studied. The results showed that for a ratio of constant discharge, with approaching to channel bed, length of circulation zone is also decreased. Moreover, stream tube dimensionless width in water surface and bed were increased and decreased, respectively.

Keywords:

T-Junction, Flow Pattern, Inflow Froude number, Separation Zone, RSM turbulence model