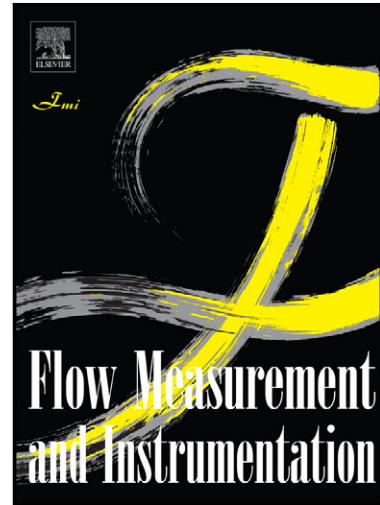


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Explicit Solution for Normal Depth of Parabolic Section of Open Channels

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ABSTRACT

To obtain the normal depth of parabolic section of open channels, multiple known parameters were incorporated into a comprehensive one by transforming basic equations, and a concept of the non-dimensional normal depth was introduced. The normal depth equations were simplified into a non-dimensional iterative formula that was proved to have a high velocity of convergence. By analyzing the comprehensive parameter and dimensionless normal depth under condition of usually adopted sizes of parabolic channels and through establishing their relationship, the iterative initial value of normal depth was obtained. The normal depth of parabolic channels was acquired by substituting the initial value into the iteration formula. The error analysis was made and a case study was provided an application example. The case study showed that the iteration formula was very simple, convenient and precise for determining the normal depth of parabolic channels with the maximum relative error of normal depth being less than 0.34% when the ratio of width to depth was between 0.2 and 20.

keywords:

irrigation channel
normal depth
parabolic section
explicit solution

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