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The Theory and Application of Upwind Finite Difference Fractional Steps Procedure for Seawater Intrusion

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ABSTRACT

Numerical simulation and theoretical analysis of seawater intrusion is the mathematical basis for modern environmental science. Its mathematical model is the nonlinear coupled system of partial differential equations with initial-boundary problems. For a generic case of a three-dimensional bounded region, two kinds of finite difference fractional steps pro- cedures are put forward. Optimal order estimates in norm are derived for the error in the approximation solution. The present method has been successfully used in predicting the consequences of seawater intrusion and protection projects.

KEYWORDS

Seawater Intrusion; Three-Dimensional Region; Upwind Fractional Steps; Norm Estimate; Numerical Simulation

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