

COLLOCATION FINITE ELEMENT SOLUTIONS FOR STEFAN
PROBLEM WITH NEUMANN BOUNDARY CONDITION

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Abstract

In this paper, we are going to consider one-dimensional Stefan problem with time-dependent Neumann boundary condition. For the problem, collocation finite element schemes constructed with variable space grid method and boundary immobilisation method are used. The newly obtained numerical results are represented for temperature distribution, the position of moving boundary and the velocity of moving boundary. The numerical results reached in this study have been compared with exact solutions and other numerical results obtained by finite difference method based on isotherm migration method. And they are found to be in good agreement with each other.

Keywords: *Stefan Problems, Variable Space Grid Method, Boundary Immobilisation Method, Collocation Finite Element Method*

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