A Numerical Solution Based on Operational Matrix of Differentiation of Shifted Second Kind Chebyshev Wavelets for a Stefan Problem

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Abstract : In this study, one dimensional phase change problem (a Stefan problem) is considered and a numerical solution of this problem is discussed. First, we use similarity transformation to convert the governing equations into ordinary differential equations with its boundary conditions. The solutions of ordinary differential equation with the associated boundary conditions and interface condition (Stefan condition) are obtained by using a numerical approach based on operational matrix of differentiation of shifted second kind Chebyshev wavelets. The obtained results are compared with existing exact solution which is sufficiently accurate.