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A New Analytic Solution for the Heat Conduction with Time-Dependent Heat Transfer Coefficient

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Abstract : An alternative approach is proposed to develop the analytic solution for one dimensional heat conduction with one mixed type boundary condition and general time-dependent heat transfer coefficient. In this study, the physic meaning of the solution procedure is revealed. It is shown that the shifting function takes the physic meaning of the reciprocal of Biot function in the initial time. Numerical results show the accuracy of this study. Comparing with those given in the existing literature, the difference is less than 0.3%.

Keywords : analytic solution, heat transfer coefficient, shifting function method, time-dependent boundary condition
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