Application of a Modified Crank-Nicolson Method in Metallurgy

Authors : Kobamelo Mashaba

Abstract : The molten slag has a high substantial temperatures range between 1723-1923, carrying a huge amount of useful energy for reducing energy consumption and CO_2 emissions under the heat recovery process. Therefore in this study, we investigated the performance of the modified crank Nicolson method for a delayed partial differential equation on the heat recovery of molten slag in the metallurgical mining environment. It was proved that the proposed method converges quickly compared to the classic method with the existence of a unique solution. It was inferred from numerical result that the proposed methodology is more viable and profitable for the mining industry.

Keywords : delayed partial differential equation, modified Crank-Nicolson Method, molten slag, heat recovery, parabolic equation

Conference Title : ICNDPDE 2022 : International Conference on Nonlinear Delay Partial Differential Equations
Conference Location : Vienna, Austria
Conference Dates : December 29-30, 2022