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# STEFAN PROBLEM EVALUATED UNDER DIFFERENT BOUNDARY CONDITIONS USING A SEMI-IMPLICIT DIFFERENCE SCHEME AND A CRANK-NICOLSON SCHEME

Stefan's problem corresponds to a range of problems of differential equations with the particularity of having a mobile border condition. In the following work, Stefan's condition is raised after obtaining it considering the diffusion in a specific region. Together with Stefan's condition, a heat equation is proposed in the region that progressively expands in the problem, so that these two equations are the starting point for a dimensionless problem that will facilitate the elimination of one of the most important characteristics of the problem in a Cartesian coordinate system: there is a singularity at the beginning of the time coordinate for the problem. This singularity is resolved by making a change of coordinates, which makes it clear that the singularity corresponds to the coordinates used to model the problem but not to the physical problem. Once this change of coordinates is made, the problem is solved numerically by proposing three types of boundary conditions: a constant, a time-dependent and a periodic condition. Finally, the results are presented in heat maps and graphs of the interface advance profile.

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