عنوان مقاله:

Moving Mesh Non-standard Finite Difference Method for Non-linear Heat Transfer in a Thin Finite Rod

نویسندگان:

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خلاصه مقاله:

In this paper, a moving mesh technique and a non-standard finite difference method are combined, and a moving mesh non-standard finite difference (MMNSFD) method is developed to solve an initial boundary value problem involving a quartic nonlinearity that arises in heat transfer with thermal radiation. In this method, the moving spatial grid is obtained by a simple geometric adaptive algorithm to preserve stability. Moreover, it uses variable time steps to protect the positivity condition of the solution. The results of this computational technique are compared with the corresponding uniform mesh non-standard finite difference scheme. The simulations show that the presented method is efficient and applicable, and approximates the solutions well, while because of producing unreal solution, the corresponding uniform mesh non-standard finite difference fails.

کلمات کلیدی:

Non-standard finite difference, positivity, moving mesh, heat conduction equation

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