A mixed finite element method for solving coupled wave equation of Kirchhofftype with nonlinear boundary damping and memory term

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Abstract

In this paper, we deal with the numerical approximation of the coupled wave equation of Kirchhoff type with nonlinear boundary damping and memory term. Since the equation is a nonlinear equation, the Raviart-Thomas mixed finite element method is one of the most suitable techniques to obtain the approximated solution. In this paper, we will show that using the Raviart-Thomas method the optimal convergence order of the scheme can be achieved. To that end, we prove the necessary lemmas and the main theorem. Finally, the efficiency of the method is certified by numerical examples.

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