

عنوان مقاله:

Stable recovery of a space-dependent force function in a one-dimensional wave equation via Ritz collocation method

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خلاصه مقاله:

In this paper, we consider the problem of approximating the displacement and the wave sink or source in a  $\backslash D$  wave equation from various measurements. First, the problem is recast as a certain hyperbolic equation. Then, we propose a Ritz approximation as the solution of the reformulated problem and apply the collocation method to convert the inverse problem to a system of linear equations. Since the problem is not well-posed, the numerical discretization of the problem may produce a system of equations that is not well-conditioned. Therefore, we apply the Tikhonov regularization method to obtain a stable solution. For the contaminated measurements, we take advantage of the mollification method in order to derive stable numerical derivatives. Several test examples are provided to show the effectiveness of the proposed technique for obtaining satisfactory results

کلمات کلیدی:

Inverse wave problem, Ritz collocation method, Tikhonov regularization, mollification technique

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