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Scheme of the finite element method with multiplicative separation of the singularity for a spectral boundary value problem for a degenerate differential operator

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Abstract

The paper deals with the numerical solution of a generalized spectral boundary value problem for an elliptic operator with degenerating coefficients. We suggest an approximate method based on the multiplicative separation of the singularity, whereby the eigenfunctions are approximated by piecewise linear functions multiplied by a weight specially chosen depending on the order of degeneration of the coefficients. For this method, we obtain error estimates justifying its optimality. © 2008 MAIK Nauka.

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