Preconditioners for Spectral Element Methods for Fourth Order Elliptic Problems

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Abstract: In this presentation we propose preconditioners for the system of linear equations that arises from a discretization of fourth order elliptic problems using spectral element methods. These preconditioners are constructed using separation of variables and can be diagonalized and hence easy to invert. We show that these preconditioners are spectrally equivalent to the quadratic forms by which we approximate them. Numerical results for the condition number are presented which reflects the effectiveness of the preconditioner for fourth order problems.

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