

Preface

While wavelets have since their discovery mainly been applied to problems in signal analysis and image compression, their analytic power has more and more also been recognized for problems in Numerical Analysis. Together with the functional analytic framework for different differential and integral equations, one has been able to conceptually discuss questions which are relevant for the fast numerical solution of such problems: preconditioning issues, derivation of stable discretizations, compression of fully populated matrices, evaluation of non-integer or negative norms, and adaptive refinements based on A-posteriori error estimators.

This research monograph focusses on applying wavelet methods to elliptic differential equations. Particular emphasis is placed on the treatment of the boundary and the boundary conditions. Moreover, a control problem with an elliptic boundary problem as constraint serves as an example to show the conceptual strengths of wavelet techniques for some of the above mentioned issues.

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