

# Besov Regularity for Second Order Elliptic Boundary Value Problems with Variable Coefficients

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## Abstract

This paper is concerned with some theoretical foundations for adaptive numerical methods for elliptic boundary value problems. The approximation order that can be achieved by such an adaptive method is determined by certain Besov regularity of the weak solution. We study Besov regularity for second order elliptic problems in bounded domains in  $\mathbb{R}^d$ . The investigations are based on intermediate Schauder estimates and on some potential theoretic framework. Moreover, we use characterizations of Besov spaces by wavelet expansions.

**Key Words:** Elliptic boundary value problems, nonlinear approximation, wavelets, adaptive methods, Besov spaces, Schauder estimates, potential theory.

**AMS Subject Classifications:** Primary 35B65, secondary 31B10, 41A46, 46E35, 65N30.

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