

Optimal Approximation of Elliptic Problem by Linear and Nonlinear Mappings II: Wavelet Methods and the Poisson Equation

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This talk is concerned with optimal approximations of the solutions of elliptic boundary value problems. After briefly recalling the fundamental concepts of optimality, we shall especially discuss best n -term approximation schemes based on wavelets. We shall mainly be concerned with the Poisson equation in Lipschitz domains. It turns out that wavelet schemes are suboptimal in general, but nevertheless they are superior to the usual uniform approximation methods. Moreover, for specific domains, i.e., for polygonal domains, wavelet methods are in fact optimal. These results are based on regularity estimates of the exact solution in a specific scale of Besov spaces.