Some remarks on shrinkage operators

Wavelet shrinkage is known to be a useful practical method to obtain various types of nonlinear approximations to smooth functions in $L_p(\mathbb{R}^d)$. In this note we point out that it is the fact that wavelets form a so-called greedy basis in various $L_p(\mathbb{R}^d)$-spaces that make wavelet shrinkage work. We study thresholding and shrinkage operators for unconditional and greedy basis in a Banach space, and show that shrinkage operators "behave well" for such bases. Optimal convergence rates for a family of thresholding operators are obtained. Finally, we study shrinkage operators for certain types of redundant systems.