ANALYSIS OF BLOCKWISE SHRINKAGE WAVELET ESTIMATES VIA LOWER BOUNDS FOR NO-SIGNAL SETTING

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Abstract. A blockwise shrinkage is a popular procedure of adaptation that has allowed the statisticians to establish an impressive bouquet of asymptotic mathematical results and develop softwares for solving practical problems. Traditionally risks of the estimates are studied via upper bounds that imply sufficient conditions for a blockwise shrinkage procedure to be minimax. This article suggests to analyze the estimates via exact (non-asymptotic) lower bounds established for a no-signal setting. The approach complements the familiar minimax, Bayesian and numerical analysis, it allows to find necessary conditions for a procedure to attain desired rates, and it sheds a new light on popular choices of blocks and thresholds recommended in the literature. Mathematical results are complemented by a numerical study.

Key words and phrases: Adaptation, asymptotic, nonparametric, minimax, Stein shrinkage, oracle, regression, small sample.