Asymptotic Minimaxity of Wavelet Estimators with Sampled Data

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Abstract:

Donoho and Johnstone (1997) studied a setting where data were obtained in the continuum white noise model and showed that scalar nonlinearities applied to wavelet coefficients gave estimators which were asymptotically minimax over Besov balls. They claimed that this implied similar asymptotic minimaxity results in the sampled-data model. In this paper we carefully develop and fully prove this implication.

Our results are based on a careful definition of an empirical wavelet transform and precise bounds on the discrepancy between empirical wavelet coefficients and the theoretical wavelet coefficients.