

## Summation of noisy orthogonal series

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We shall discuss the issue of numerical reconstruction of some function, when noisy Fourier coefficients are given and the level of noise is known. For bounded deterministic noise this is a classical problem, while for statistical noise this is an instance of regression. The quality of any method of reconstruction depends on the underlying smoothness. We discuss the situation, when smoothness is measured in some weighted Hilbert space with respect to the Fourier system. This allows to treat problems varying in the range of very mildly ill-posed to severely ill-posed ones. Some geometric features are highlighted.