Regularization by preconditioning

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In this talk, we discuss some preconditioning techniques for the regularization of ill-posed problems. In particular, we first identify a set of approximation processes which regularizes the inversion of real functions. Then, such processes are used as a basic tool for the computation of preconditioners endowed with regularizing properties. We show that these preconditioners provide fast convergence and noise control of iterative methods for discrete ill-posed and structured linear systems.

The regularization properties of the preconditioning techniques are assessed by means of several image deblurring numerical tests.

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