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**On self-regularization of ill-posed problems in Banach spaces
by projection methods.**

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Abstract.

We consider ill-posed linear operator equations with operators acting between Banach spaces. For the stable solution of ill-posed problems regularization is necessary, and for using computers discretization is necessary.

In some cases discretization may also be used as regularization method with discretization parameter as regularization parameter, additional regularization is not needed.

Regularization by discretization is called self-regularization. We consider self-regularization by projection methods, giving necessary and sufficient conditions for self-regularization by a priori choice of the dimension of subspaces as the regularization parameter. Convergence conditions are also given for the choice of the dimension by the discrepancy principle, without the requirement that the projection operators are uniformly bounded.