

A Projection-Type Discrete Regularization for Ill-Posed Operator Equations

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Discrete regularization methods are often applied for obtaining stable approximate solutions for ill-posed operator equations $Tx = y$, where $T : X \rightarrow Y$ is a bounded operator between Hilbert spaces with non-closed range $R(T)$ and $y \in R(T)$. Most of the existing such methods involve finite rank bounded projection operators on either the domain space X or on codomain space Y or on both. In this talk we consider a discrete regularization based on finite rank projection-like operators on some subspace of the codomain space such that their ranges need not be subspaces of the codomain space. This method not only includes some of the existing projection based methods but also a quadrature based collocation method considered by the author in (2011) for integral equations of the first kind.

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