

Variational Inequalities and Improved Convergence Rates for Tikhonov Regularisation on Banach Spaces

Markus Grasmair

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In this paper we derive higher order convergence rates in terms of the Bregman distance for Tikhonov like convex regularisation for linear operator equations on Banach spaces. The approach is based on the idea of variational inequalities, which are, however, not imposed on the original Tikhonov functional, but rather on a dual functional. Because of that, the approach is not limited to convergence rates of lower order, but yields the same range of rates that is well known for quadratic regularisation on Hilbert spaces.

Subjects: **Optimization and Control (math.OC)**; Numerical Analysis (math.NA)

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