1046-49-1182 **Otmar Scherzer*** (`otmar.scherzer@uibk.ac.at`), Institute of Mathematics, Technikerstr. 21A, 6020 Innsbruck, Austria. *Sparse Regularization with l-q Penalty Term.*

We consider the stable approximation of sparse solutions to non-linear operator equations by means of Tikhonov regularization with a subquadratic penalty term. Imposing certain assumptions, which for a linear operator are equivalent to the standard range condition, we derive the usual convergence rate $O(\sqrt{\delta})$ of the regularized solutions in dependence of the noise level δ. Particular emphasis lies on the case, where the true solution is known to have a sparse representation in a given basis. In this case, if the differential of the operator satisfies a certain injectivity condition, we can show that the actual convergence rate improves up to $O(\delta)$.

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