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Heuristic parameter choice in Tikhonov regularization from minimizers of the quasi-optimality function.

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Abstract.
We consider choice of the regularization parameter in Tikhonov method in the case of the unknown noise level of the data. From known heuristic parameter choice rules often the best results were obtained in the quasi-optimality criterion where the parameter is chosen as the global minimizer of the quasi-optimality function. In some problems this rule fails, the error of the Tikhonov approximation is very large. We prove, that one of the local minimizers of the quasi-optimality function is always a good regularization parameter. We propose some algorithms for finding a proper local minimizer of the quasi-optimality function.