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REGULARIZATION PROPERTIES OF TIKHONOV REGULARIZATION WITH SPARSITY CONSTRAINTS*

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Abstract. In this paper, we investigate the regularization properties of Tikhonov regularization with a sparsity (or Besov) penalty for the inversion of nonlinear operator equations. We propose an a posteriori parameter choice rule that ensures convergence in the used norm as the data error goes to zero. We show that the method of surrogate functionals will at least reconstruct a critical point of the Tikhonov functional. Finally, we present some numerical results for a nonlinear Hammerstein equation.

Key words. inverse problems, sparsity

AMS subject classifications. 65J15, 65J20, 65J22

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