

EXPANDING THE APPLICABILITY OF A  
NEWTON-LAVRENTIEV REGULARIZATION METHOD  
FOR ILL-POSED PROBLEMS

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**Abstract.** We present a semilocal convergence analysis for a simplified Newton-Lavrentiev regularization method for solving ill-posed problems in a Hilbert space setting. We use a center-Lipschitz instead of a Lipschitz condition in our convergence analysis. This way we obtain: weaker convergence criteria, tighter error bounds and more precise information on the location of the solution than in earlier studies (such as [13]).

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**Key words.** Newton-Lavrentiev regularization method, ill-posed problem, Hilbert space, semilocal convergence, Lipschitz condition.

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