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A LOCAL CONVERGENCE THEOREM FOR THE INEXACT NEWTON METHOD AT SINGULAR POINTS

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Abstract. If Newton's method is used to find a solution of an equation on a Banach space, and the Fréchet-derivative is singular at the solution, the convergence of Newton iterates to the solution is linear rather than quadratic. In this study we employ the inexact Newton method to restore quadratic convergence, especially in cases when Newton's or the corrected Newton's method cannot achieve this or cannot even be used.

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