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LOCAL AND SEMILOCAL CONVERGENCE THEOREMS FOR NEWTON'S METHOD BASED ON CONTINUOUSLY FRÉCHET DIFFERENTIABLE OPERATORS

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Abstract. We approximate locally unique solutions of nonlinear equations in a Banach space setting using Newton's method. In contrast with earlier works which are based on the Lipschitz continuity of the operators involved, we only use the continuity of the first Fréchet derivative of the operator involved. Local and semilocal convergence theorems are given and the quadratic convergence of Newton's method under weaker than before conditions is established.

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