A superquadratic method for solving generalized equations in the Hölder case

M. GEOFFROY - A. PIETRUS

Abstract

We investigate the existence of a sequence (x_k) satisfying $0 \in f(x_k) + \nabla f(x_k)(x_{k+1} - x_k) + \frac{1}{2}\nabla^2 f(x_k)(x_{k+1} - x_k)^2 + G(x_{k+1})$ and converging to a solution x^* of the generalized equation $0 \in f(x) + G(x)$; where f is a function and G is a set-valued map acting in Banach spaces. We show that the previous sequence is locally superquadratic convergent to x^* whenever $\nabla^2 f$ satisfies a Hölder-type condition and the set-valued map $[f(x^*) + \nabla f(x^*)(\cdot - x^*) + \frac{1}{2}\nabla^2 f(x^*)(\cdot - x^*)^2 + G(\cdot)]^{-1}$ is M-pseudo-Lipschitz around $(0, x^*)$.