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A least-square semismooth Newton method for the second-order cone complementarity problem. (English) Zbl 1251.90368

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Summary: We present a nonlinear least-square formulation for the second-order cone complementarity problem based on the Fischer-Burmeister (FB) function and the plus function. This formulation has two advantages. First, the operator involved in the over-determined system of equations inherits the favourable properties of the FB function for local convergence, for example, (strong) semi-smoothness; secondly, the natural merit function of the over-determined system of equations shares all the nice features of the class of merit functions f_{YF} studied in [the second author and *P. Tseng*, Math. Program. 104, No. 2–3 (B), 293–327 (2005; Zbl 1093.90063)] for global convergence. We propose a semi-smooth Levenberg-Marquardt method to solve the arising over-determined system of equations and establish the global and local convergence results. Among others, a superlinear (quadratic) rate of convergence is obtained under strict complementarity of the solution and a local error bound assumption, respectively. Numerical results verify the advantages of the least-square reformulation for difficult problems.

MSC:

90C33 Complementarity and equilibrium problems and variational inequalities (finite dimensions) (aspects of mathematical programming)

Cited in **2** Documents

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Software:

SeDuMi

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