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一簇非线性等式约束优化问题的过滤线搜索修正正割方法

王祝君[1], 朱德通[2]

1. 湖南工程学院理学院, 湘潭 411104;
2. 上海师范大学商学院, 上海 200234

A Class of Line Search Filter Improved Secant Methods for Nonlinear Equality Constrained Optimization

WANG Zhujun[1], ZHU Detong[2]

1. Science College, Hunan Institute of Engineering, Xiangtan 411104;
2. Business College, Shanghai Normal University, Shanghai 200234

- 摘要
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全文: PDF (442 KB)   HTML (1 KB)   输出: BibTeX | EndNote (RIS)   背景资料

摘要 本文提供了一簇新的过滤线搜索修正正割方法求解非线性等式约束优化问题. 新算法簇的特点是: 用修正正割算法簇中的一个算法获得搜索方向, 回代线搜索技术得到步长, 过滤准则用来 决定是否接受步长, 引入二阶校正技术减少不可行性并克服Maratos效应. 在合理的假设条件下, 分析了算法的总体收敛性. 并证明了, 通过附加二阶校正步, 算法簇克服了Maratos效应, 并二步Q-超线性收敛到满足二阶充分最优条件的局部解. 数值结果表明了所提供的算法具有有效性.

关键词: 约束优化   过滤方法   正割算法   Maratos效应   二阶校正

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Abstract： This paper proposes a new class of line search filter improved secant methods for general nonlinear equality constrained optimization. The feature of these new algorithms is that one of the improved secant algorithms is used to produce a search direction, a backtracking line search procedure to generate step size, some filtered rules to determine step acceptance, second order correction technique to reduce infeasibility and overcome the Maratos effects. Under mild assumptions the global convergence is established. Moreover, it is also established that the Maratos effect are overcome in our new approaches by adding second order correction steps so that two-step Q-superlinear convergence to second order sufficient local solution is achieved. The results of numerical experiments are reported to show the effectiveness of these proposed algorithms.

Key words： constrained optimization   filter method   secant algorithm   Maratos effect   hskip1.54cm second order correction

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