

线性等式约束优化的既约预条件共轭梯度路径法

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摘要 采用既约预条件共轭梯度路径结合非单调技术解线性等式约束的非线性优化问题. 基于广义消去法将原问题转化为等式约束矩阵的零空间中的一个无约束优化问题, 通过一个增广系统获得既约预条件方程, 并构造共轭梯度路径解二次模型, 从而获得搜索方向和迭代步长. 基于共轭梯度路径的良好性质, 在合理的假设条件下, 证明了算法不仅具有整体收敛性, 而且保持快速的超线性收敛速率. 进一步, 数值计算表明了算法的可行性和有效性.

关键词 [共轭梯度路径](#), [既约预条件](#), [非单调技术](#).

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A Reduced Preconditional Conjugate Gradient Path Method for Linear Equality Constrained Optimization

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Abstract A reduced preconditional conjugate gradient path method with nonmonotonic technique for linear equality constrained optimization problem is proposed. By using the generalized elimination method, the subproblem is equivalent to an unconstrained optimization problem in the null space of constrained matrix. We develop preconditioners based on an extended system. By employing the reduced preconditional conjugate gradient path search strategy, we obtain an iterative direction by solving the quadratic model as well as the iterative step. Based on the good properties of the conjugate gradient path, the global convergence results of the proposed algorithm are proved while fast local superlinear convergence rate is established under some reasonable conditions. Furthermore, numerical results indicate that the algorithm is feasible and effective.

Key words [Conjugate gradient path](#), [reduced preconditional](#), [nonmonotonic technique](#).

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