

数学与系统科学研究院

计算数学所学术报告

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报告题目:

**Feasible Smoothing Quadratic  
Regularization Method for Box  
Constrained Non-Lipschitz  
Optimization**

邀请人: 刘歆 博士

报告时间: 2014 年 5 月 31 日 (周六)

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报告地点: 科技综合楼三层 311

计算数学所报告厅

## **Abstract:**

We propose a smoothing quadratic regularization (SQR) method for solving box constrained optimization problems with a non-Lipschitz regularization term that includes the  $l_p$  norm ( $0 < p < 1$ ) of the gradient of the underlying image in the  $l_2$ - $l_p$  problem as a special case. At each iteration of the SQR algorithm, a new iterate is generated by solving a strongly convex quadratic problem with box constraints and the smoothing parameter is updated by a simple criterion. We define an  $\epsilon$  ( $\epsilon \geq 0$ ) scaled first order stationary point of the box constrained non-Lipschitz optimization problem. We prove that any cluster point of  $\epsilon$  scaled first order stationary points with  $\epsilon > 0$  satisfies a first order necessary condition for a local minimizer as  $\epsilon$  goes to  $0$ , and the worst-case iteration complexity of the SQR algorithm for finding an  $\epsilon$  scaled first order stationary point is  $O(\epsilon^{-2})$ . Numerical examples are given to validate the worst-case complexity result and show good performance of the SQR algorithm for image restoration.

欢迎大家参加!