

数学与系统科学研究院

计算数学所学术报告

报告人: **Associate Prof. Yong Xia**

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报告题目:

**New results on  $L_1$ -constrained  
nonconvex quadratic optimization  
problem**

邀请人: 戴彧虹 研究员

报告时间: **2013 年 4 月 23 日 (周二)**

**下午 15:30-16:30**

报告地点: **科技综合楼三层 311**

**计算数学所报告厅**

## **Abstract:**

In this talk, we study the  $L_1$ -constrained nonconvex quadratic optimization problem (QPL1). Firstly, we show it is NP-hard, even when the off-diagonal entries of the Hessian are all nonnegative. Secondly, we give a complete answer to Pinar and Teboulle's open problem on the nonlinear semidefinite programming (SDP) relaxation of (QPL1). The analytical approach is extended to  $\ell_p$ -constrained quadratic programs with  $1 < p < 2$ . Thirdly, we show that the direct SDP relaxation of (QPL1) is equivalent to the optimal d.c. bound for the standard quadratic programming reformulation of (QPL1). Then we disprove a conjecture about the tightness of the direct SDP bound. Finally, as an extension of (QPL1), we study the relaxation problem of the sparse principal component analysis, denoted by (QPL2L1). We show that the existing direct SDP bound for QPL2L1 is equivalent to the doubly nonnegative relaxation for variable-splitting reformulation of (QPL2L1).

欢迎大家参加!