

**数学与系统科学研究院**

**计算数学所学术报告**

**报告人: Dr. Shi-qian Ma**

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**报告题目:**

**Fixed point and Bregman iterative  
methods for matrix rank minimization**

**邀请人: 袁亚湘研究员**

**报告时间: 2008年12月30日(周二)**

**下午 3:30—5:00**

**报告地点: 科技综合楼三层 311**

**计算数学所报告厅**

**Abstract:**

**The linearly constrained matrix rank minimization  
problem is widely applicable in many fields such as**

**control, signal processing and system identification. The linearly constrained nuclear norm minimization is a convex relaxation of this problem. Although it can be cast as a semidefinite programming problem, the nuclear norm minimization problem is expensive to solve when the matrices are large. In this paper, we propose fixed point and Bregman iterative algorithms for solving the nuclear norm minimization problem and prove convergence of the first of these algorithms. By using a homotopy approach together with an approximate singular value decomposition procedure, we get a very fast, robust and powerful algorithm that can solve very large matrix rank minimization problems. Our numerical results on randomly generated and real matrix completion problems demonstrate that this algorithm is much faster and provides much better recoverability than semidefinite programming solvers such as SDPT3.**

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