

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:

**large On the Optimal Linear
Convergence Rate of a Generalized
Proximal Point Algorithm**

邀请人: 戴彧虹 研究员

报告时间: 2016 年 1 月 20 日 (周三)

上午 10:00

报告地点: 数学院南楼七层

702 会议室

Abstract:

The proximal point algorithm (PPA) has been well studied in the literature. In particular, its linear convergence rate has been studied by Rockafellar in 1976 under certain condition. We consider a generalized PPA in the generic setting of finding a zero point of a maximal monotone operator, and show that the condition proposed by Rockafellar can also sufficiently ensure the linear convergence rate for this generalized PPA. Indeed we show that these linear convergence rates are optimal. Both the exact and inexact versions of this generalized PPA are discussed. The motivation to consider this generalized PPA is that it includes as special cases the relaxed versions of some splitting methods that are originated from PPA. Thus, linear convergence results of this generalized PPA can be used to better understand the convergence of some widely used algorithms in the literature. We focus on the particular convex minimization context and specify Rockafellar's condition to see how to ensure the linear convergence rate for some efficient numerical schemes, including the classical augmented Lagrangian method proposed by Hensen and Powell in 1969 and its relaxed version, the original alternating direction method of multipliers (ADMM) by Glowinski and Marrocco in 1975 and its relaxed version (i.e., the generalized ADMM by Eckstein and Bertsekas in 1992). Some refined conditions weaker than existing ones are proposed in these particular contexts.

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