

**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: Lie group integrators**

**邀请人: 洪佳林研究员**

**报告时间: 2008年6月12日(周四)**

**上午 10:30–11:30**

**报告地点: 科技综合楼三层 311**

**计算数学所报告厅**

**报告摘要: Most conventional time integrators**

**(ODE solvers) in linear spaces are constructed by using a**

**clever combination of essentially two primitive operations (i)**

**Evaluating the ODE vector field (ii) Taking linear**

**combinations of such derivative evaluations. Of course we**

**must allow for the computation of the vector field at**

**"unknown points" thus leading to implicit schemes. But in this way we can recover Runge–Kutta–, multistep–, collocation–, projection– and general linear methods as well as many other types of schemes. Suppose that we replace the linear space by a manifold. Then it is no longer possible to take linear combinations of the vector field at different points, since they are now tangent vectors which belong to different spaces. One way of seeing Lie group integrators is a way to generalize the two primitive building blocks in such a way that the "same methods" work also on manifolds.**

**In this talk, we shall give a first introduction to Lie group integrators. We begin by presenting a few examples where the methods have shown a good potential. Secondly, we explain the right setting for these integrators, using the language of group actions on a manifold. Trying to generalize conventional methods, one immediately runs into many challenges, we will explain some of them. Many problems have been solved in the last decade, but there are still open problems. We will discuss both.**

**欢迎大家参加！**