数学与系统科学研究院

计算数学所学术报告

（定期学术报告）

报告人： **Dr. Xian-Min Xu**

（**Institute of Computational Mathematics, Academy of Mathematics and Systems Science Chinese Academy of Sciences**）

报告题目：**Cavitation: An example with Lavrentiev phenomenon in Nonlinear elasticity**

报告时间：**2010 年 6 月 17 日（周四）**

下午 4:00～5:00

报告地点：科技综合楼三层 **311**

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Abstract：

Cavitation means the formation and rapid expansion of voids in some solid materials under tension. This is firstly experimentally discovered by Gent & Lindey in 1959 and studied in nolinear elasticity theory by many researchers. Basically speaking, cavitation is the solution of some energy minimizing problems with Lavrentiev phenomenon. Lavrentiev phenomenon for some functional $E(u) = \int_{\Omega} W(x, u, \nabla u) dx$ **implies that the functional has different minimizers in different functional spaces. For example,** $\min_{u \in W^{1,P}} E(u)$ **might be strictly smaller than** $\min_{u \in W^{1,\infty}} E(u)$. **Such a property makes it very diffcult to detect the singular minimizer, which is in** $W^{1,P}$ **but not in** $W^{1,\infty}$, **by traditional finite element methods. In this talk, I will introduce the numerical challenges for such singular minimizer detecting problems, and review some known numerical treatments. I will show that all such known methods are unable to simulate the original cavitation problems. The trials to compute some simplifed models for cavitation are also introduced.**

欢迎大家参加！