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： **Recent advances in the analysis of nonlinear problems of the mechanics of structures**

邀请人 ：林群研究员

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下午4：00—5：00

报告地点： 科技综合楼三层301

计算数学所报告厅

Abstract ：

Among some nonlinear problems arising from the mechanics of structures and discussed recently by the author together with some co-workers, the present lecture will focus on two main points:

- The multiplicity of solutions to nonlinear membrane equations,

- A stability result in the obstacle problem for a plate.

In the first part, we study a nonlinear shell within finite deformations and we concentrate on the equilibrium in the case "without thickness", that is when the shell becomes a membrane. We observe that without any external loads there exist several trivial solutions. After some understanding of the structure of the problem, we prove that there exist in fact infinitely many solutions. Most of these solutions are saddle points of a functional, which intuitively means unstable, but there is also an infinity of solutions which are minima of the same functional, which intuitively means stable! We close this part of the lecture by the questions addressed by this multiplicity result to critical point and bifurcation theories.

In the second part we are considering a linear elastic plate. The so-called obstacle problem consists in studying the equilibrium solution of the plate when, submitted to some external force, it enters into contact with an obstacle. Such a solution is characterized by the size and by the smoothness of the contact zone between the deformed plate and the obstacle. Under some smoothness assumptions, our stability result gives a relation between the changes of the external load and the evolution of the boundary of the contact zone.

欢迎大家参加！