MATHEMATICS COLLOQUIUM

DYNAMIC CONTACT PROBLEMS WITH THE SIGNORINI CONDITIONS

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Abstract: Recently, considerable progress of contact problems has been achieved by many applied mathematicians. In most of their works, the contact problems were cast as variational inequalities in terms of solutions. As a result, contact forces are removed from the formulation and their behavior remains mystery. In our approach, we keep the contact forces as a part of the complementarity conditions. This makes more complicated since we need to obtain a suitable bound on the contact forces. In this talk, we consider a class of dynamic frictionless contact problems formulated in abstract setting without viscosity. The contact conditions for the contact problems are Signorini-type complementarity conditions. The crucial assumption for our theory is that the contact forces satisfy the strong pointedness condition, which can usually be related to the Sobolev embedding theorem. Using the time discretization, we investigate the convergence of numerical discrete trajectories to solutions of the continuous problem. Our numerical scheme is implemented with nonsmooth Newtons method which solves the complementarity problem that arises in the numerical method. We present some numerical results. Our numerical results give some evidence of conservation of energy for the purely elastic case.

Date: Wednesday, **February 20, 2008**
Time: 4:00 pm – 5:00 pm
Place: J. Wiener Lecture Hall, MAGC 1.302

Refreshments will be served at 3:50pm.

For further information or for special accommodations, contact Dr. Karen Yagdjian at 381-2145, via email at yagdjian@utpa.edu, or visit www.math.panam.edu/colloquia.html