

# Department of Mathematical Sciences Colloquium

ANDRZEJ POWNUK

## *General Interval FEM Program Based on Sensitivity Analysis Method*

Today there are many methods for solution of equation with interval parameters. Unfortunately there are very few efficient methods which can be directly applied for solution of complex engineering problems. Sensitivity analysis method gives very good inner approximation of the exact solution set. This method was implemented in C++ language by the author and the program can be recompiled on Windows, Linux and Solaris operating systems. The program is able to solve 1D, 2D and 3D linear problems of elastostatics with interval parameters. In order to describe structure with uncertain parameters special scripting language was applied. The program is able to solve problems using endpoint combination method and Taylor expansion method. Additionally it is possible to solve problems with uncertain functional parameters. In order to do that it is necessary to use special finite elements. The program is very universal and can be applied to the solution of complex engineering problem. The program is a part web application, which is written in php language and can be run on the authors web page <http://andrzej.pownuk.com>. The program is object oriented and can be very easily extended to the solution of more complicated problems like for example nonlinear problems of computational mechanics.

**Friday, September 7, 2007 at 3 pm in Bell Hall 143  
The University of Texas at El Paso**

Refreshments will be served in front of the colloquium room, 15 minutes before the start of the colloquium.

For further information, please contact Dr. Pavel Šolín, Bell Hall 220. Phone: (915) 747-6770, email: [solin@utep.edu](mailto:solin@utep.edu).