MATHEMATICS DEPARTMENT
North Carolina State University

DIFFERENTIAL EQUATIONS SEMINAR

Wednesday, October 17, 2007
3:00 p.m. 330 Harrelson Hall

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Algebraic dichotomies and the stability of Riemann solutions of conservation laws

Dichotomies, ordinary or weighted, are important concepts in dynamical systems theory. The most well-known example is the exponential dichotomy where the growth or decay is measured by the weight function $e^{\mu x}$. Recently, there has been some interest on the stability of waves where the functions involved grow or decay at an algebraic rate $|x|^{\mu}$. In this talk we define the so called algebraic dichotomy that may be useful to treat such problems. We discuss basic properties of the algebraic dichotomy, methods of detecting it and calculating the power of the weight function.

We present several examples: (1) The Bessel equation. (2) The n-degree Fisher type equation. (3) Hyperbolic conservation laws in similarity coordinates. (4) A system of conservation laws with a Dafermos type artificial viscous regularization. This example motivates our work on algebraic dichotomies.

Graduate students are invited to attend

For questions, comments, and offers to talk, contact Dmitry Zenkov, dvzenkov@math.ncsu.edu. Please visit the DE Seminar web page at http://www.math.ncsu.edu/DE/