

MATHEMATICS DEPARTMENT
North Carolina State University

DIFFERENTIAL EQUATIONS SEMINAR

Wednesday, October 2, 2002
2:35 p.m. 330 Harrelson Hall

Steve Schechter

Department of Mathematics
North Carolina State University

“Stability of self-similar solutions of the Dafermos regularization of a system of conservation laws”

In contrast to a viscous regularization of a system of conservation laws, a Dafermos regularization admits many self-similar solutions of the form $u = u(X/T)$. In particular, it is known in many cases that Riemann solutions of a system of conservation laws have nearby self-similar smooth solutions of an associated Dafermos regularization (Riemann-Dafermos solutions). After a change of coordinates, Riemann-Dafermos solutions become stationary, and their time-asymptotic stability as solutions of the Dafermos regularization can be studied by linearization. We study the stability of Riemann-Dafermos solutions near Riemann solutions consisting of n Lax shock waves. We show, by studying the essential spectrum of the linearized system in a weighted function space, that stability is determined by eigenvalues only. We then use asymptotic methods to study the eigenvalues and eigenfunctions.

This is joint work with Xiao-Biao Lin.

Graduate students are invited to attend.

For questions, comments, and offers to talk, contact Steve Schechter, schechter@math.ncsu.edu.
Please visit the DE Seminar web page at www.math.ncsu.edu/seminars.html.