

MATHEMATICS DEPARTMENT  
North Carolina State University

## DIFFERENTIAL EQUATIONS SEMINAR

Wednesday, September 17, 2003  
2:35 p.m. 330 Harrelson Hall

**Gregory Lyng**

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### “Another look at Majda’s model for reacting flow”

The Majda model is a simplified combustion model that plays a role in combustion theory analogous to that of Burgers Equation in the theory of (non-reacting) compressible fluid flow. In the context of this simplified model, we describe the use of Evans function techniques to calculate stability indexes for both weak and strong detonation waves yielding useful necessary conditions for stability. Along the way we discuss the existence of various viscous profiles, the Riemann Problem, and compare our results to previous work on the Majda model. Finally, unlike previous stability analyses of the Majda model, we indicate how the Evans function method can be extended to the full reacting Navier-Stokes equations. This is joint work with Kevin Zumbrun.

**Graduate students are invited to attend.**

For questions, comments, and offers to talk, contact Steve Schecter, [schecter@math.ncsu.edu](mailto:schecter@math.ncsu.edu).  
Please visit the DE Seminar web page at [www.math.ncsu.edu/seminars.html](http://www.math.ncsu.edu/seminars.html).