

MATHEMATICS DEPARTMENT
North Carolina State University

DIFFERENTIAL EQUATIONS SEMINAR

Wednesday, April 6, 2005
2:35 p.m. 330 Harrelson Hall

Ben Texier

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Highly nonlinear geometrical optics and laser-plasma interactions

The Euler-Maxwell equations describing laser-plasma interactions satisfy structural *transparency* properties. As a consequence, in a weakly nonlinear regime, their high-frequency limit is a simple linear transport equation. Therefore, to reach a nonlinear regime, *large-amplitude solutions* have to be considered. The time existence of such solutions typically shrinks to zero in the high-frequency limit. A study of the *resonances* allows to prove that, under a well-preparedness assumption and in the high-frequency limit, the existence time of large-amplitude solutions of the Euler-Maxwell equations is bounded from below, and that these solutions are well approximated by solutions of the Zakharov equations.

I use the techniques of geometrical optics as developed by Joly, Métivier and Rauch in the nineties, and a recent result by Lannes on norms of pseudo-differential operators with limited regularity.

Graduate students are invited to attend.

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