Department of Mathematics

University of Houston

Scientific Computing Seminar

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Wave Propagation in Advected Acoustics within A Non-Uniform Medium under the effect of Gravity

Tuesday, Sep. 4, 2012 11:00 AM- 12:00 PM Room 646 PGH

Abstract: We linearize the Euler equations of fluid-dynamics for uniform main flow in non-uniform medium under the influence of gravity. This case differs from the one of advected acoustics in a uniform atmosphere (constant density) in two respects:

- 1. The linearized equations do not admit a plane wave solution, but rather a "pseudo-plane-wave" one, in the sense that the coefficient–vector of the "wave form" is not constant , but rather depends on a space coordinate.
- 2. There is no dispersion relation that results from an algebraic solvability condition. Instead, the entries of the coefficient–vector satisfy a system of ordinary differential equations, with the wave numbers being parameters in these o.d.e's. Their solution leads to a constraint similar to the dispersion relation.

We provide an explicit analytic solutions to this problem. The analytic solution provides some insights on wave propagation in the non–uniform atmosphere.

This seminar is easily accessible to persons with disabilities. For more information or for assistance, please contact the Mathematics Department at 743-3500.