58:191

GRADUATE SEMINAR: MECHANICAL ENGINEERING THERMAL-FLUIDS SECTION

Error Estimation in Numerical and Asymptotic Solutions for Reacting Flows

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Abstract: Exact solutions for systems of nonlinear partial differential equations are generally unavailable. Consequently, one is usually led to approximations of the true solution. Typically these approximations are made in certain asymptotic limits or through numerical discretization. However, one is often unsure if one's method is converging to a true solution or a spurious solution which arises from the method of approximation. Such issues are particularly relevant in compressible reacting flows which contain both convective nonlinearities and nonlinear source terms. This seminar will address such issues for a representative flow known as oblique detonation, which is comprised of an attached oblique shock wave followed by a zone of chemical reaction. The solution is approximated by both asymptotic and numerical methods. Quantitative determination of the accuracy of each method cannot be made, but can itself be approximated in suitable ranges of parameter space.

Thursday, February 6, 1992
Engineering Building Room 2129
3:30 - 4:20 p.m.

If you would like to meet with Prof. Powers, please call P.B. Butler at 335-5672.