

ANALYSIS SEMINAR

NUMERICAL APPROXIMATION ENGINEERING

**A. Louise Perkins, Pippin
Welmon, Keelia Altheimer**
730 BEACH BLVD., LONG BEACH, MS

THURSDAY, APRIL 13, 2005, IN ROOM 331 AT 3:00 PM

Abstract: A method is presented for designing derivatives for finite difference approximations that achieve specified accuracy in the frequency domain. A general average value approximation with undetermined coefficients is fitted in the spatial frequency domain to attain the desired properties of the approximation. A set of constraints to insure that the approximation converges as the grid spacing approaches zero and satisfies the Lax Equivalence Theorem are imposed on the fitted coefficients. A practical design of the approximations is pursued using an heuristic zero placement method which results in a linear matrix formulation.