Meeting: 1005, Newark, Delaware, SS 7A, Special Session on Frontiers on Complex Fluid Flows: Analytic and Computational Methods

1005-65-12   **Noel F Heitmann*** (`heitmann@millersville.edu`), Department of Mathematics, P.O. Box 1002, Millersville, PA 17551-0302. *Subgrid scale stabilization of evolutionary diffusive transport problems.* Preliminary report.

A multiscale finite element method is presented for time dependent convection diffusion problems. Scale separation allows a paramaterized artificial viscosity term to be added only to the fine scales of a finite element mesh in a variationally consistent manner. Complete error analysis with a Crank-Nicholson time discretization reveals a near optimal error bound that is independent of the diffusion coefficient, epsilon. Additionally, optimal parameter selection for common finite element spaces is provided. (Received January 28, 2005)