

Meeting: 1002, Pittsburgh, Pennsylvania, SS 5A, Special Session on Multiscale Algorithms in Computational Fluid Dynamics

1002-76-242 **Noel F Heitmann*** (heitmann@millersville.edu), Department of Mathematics, Millersville University of Pennsylvania, P.O. Box 1002, Millersville, PA 17551-0302. *Subgrid Stabilization of Evolutionary Convection-Diffusion Equations: Analysis and Experimental Results of a Finite Difference Scheme*. Preliminary report.

A finite difference approximation for time-dependent convection dominated diffusive transport problems is presented in which stabilization is provided via the addition of artificial viscosity acting only on the small scales of the discretized domain. The difference scheme is based on previous works by Guermond and by Layton, in which the idea has been developed mainly for the stationary problem with finite elements. The method is shown to be conditionally stable and evidence is provided to support a conjecture of unconditional stability. Experimental results are also presented. (Received September 15, 2004)