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

1002-65-233 **Lizette Zietsman*** (lzietsma@gmu.edu), Department of Mathematical Sciences, George Mason University, 4400 University Drive MS 3F2, Fairfax, VA 22030, **Jeff T Borggaard** (jborggaard@vt.edu), Department of Mathematics, Virginia Tech, Blacksburg, VA 24061, and **John A Burns** (burns@icam.vt.edu), Department of Mathematics, Virginia Tech, Blacksburg, VA 24061. *Computational Methods for Feedback Control of Distributed Parameter Systems.*

In this paper we discuss efficient computational algorithms for computing feedback gains for optimal feedback control of systems governed by partial differential equations. This problem is motivated by applications in fluid flow control. In particular, we study adaptive finite element methods suitable for both Riccati and Chandrasekhar equations. Numerical results using 1D and 2D linear and nonlinear equations compares the adapted solutions to standard finite element solutions. These examples also illustrate that refinements can lead to ill-conditioned Riccati equations. (Received September 14, 2004)