1035-35-690        **David C. Szurley\*** (`dszurley@fmarion.edu`), 405 N. Ebenezer Rd., Florence, SC 29501.
*Adjoint-Based Optimization Applied to a System of Nonlinear Partial Differential Equations.*

There are many techniques to solve optimization problems. Adjoint-based optimization methods transform constrained optimization problems into unconstrained optimization problems. We may apply adjoint-based optimization to real-world physical processes modeled by partial differential equations. In this setting, we would like to optimize an aspect of the process subject to the modeling equations.

The abstract setting for adjoint-based optimization will be described, and its advantages over other techniques will be discussed. Then adjoint-based optimization will be used to solve a problem in fluid flow modeled by partial differential equations. (Received September 13, 2007)