1014-65-1485 **Lisa G. Davis*** (davis@math.montana.edu), Department of Mathematical Sciences, 2-214 Wilson Hall, Bozeman, MT 59171-2400, and **John Singler** (John.Singler@oregonstate.edu), Dept. of Mechanical Engineering, 204 Rogers Hall, Corvallis, OR 97331-6001. *Sensitivity Analysis and Control of Systems Governed by Partial Differential Equations.*

Combining sensitivity analysis with optimal control techniques for systems governed by partial differential equations is discussed. The overall research program focuses on the use of sensitivity analysis for sensor and actuator placement for control systems of Micro Air-Vehicles. An example of an Euler Bernoulli beam model with a patch actuator is considered, and sensitivity analysis is with respect to actuator location. Sensitivity analysis is performed using a Continuous Sensitivity Equation Method approach where the governing PDE is implicitly differentiated with respect to the parameter of interest in order to derive a new PDE referred to as the sensitivity equation. Finite element techniques are used in order to simulate the behavior of both the beam and the sensitivity systems. Introducing control terms into the beam model also allows one to compute the sensitivity of the control with respect to the parameter of interest. (Received September 28, 2005)