1035-Z1-1629 **Sheldon Lee*** (lee@math.colostate.edu), 101 Weber Building, Colorado State University, Fort Collins, CO 80523-1874, and **Don Estep**. *Adaptive Error Control for an Elliptic Optimization Problem.*

In this talk we study optimization of a quantity of interest of a solution of an elliptic problem, with respect to parameters in the data using a gradient search algorithm. We use the generalized Green's function as an efficient way to compute the gradient. We analyze the effect of numerical error on a gradient search, and develop an efficient way to control these errors using a posteriori error analysis. Specifically, we devise an adaptive algorithm to refine and unrefine the finite element mesh at each step in the descent search algorithm. We give basic examples and apply this technique to a model of a healing wound. (Received September 20, 2007)