1056-93-741 **Wolfgang Kliemann*** (kliemann@iastate.edu), Iowa State University, Department of Mathematics, 396 Carver Hall, Ames, IA 50011. *Optimal Parameter Tuning for Stability under Uncertainty.*

This paper considers stability of ordinary differential equations under (deterministic or stochastic) uncertainty. The uncertainty is modeled either as a set of functions with values in a given range, or as a stochastic process with values in the same range. We assume that the system has a common fixed point for all values of the disturbance, and analyze the stability of this equilibrium via Lyapunov exponents. We introduce the idea of (deterministic and stochastic) stability radii and analyze some of their properties, including the relation between radii for the original system and its linearization at the fixed point. For a given system with tunable parameters, we are interested in finding the optimal parameter value in the sense that (one of) the stability radii become maximal. As a nontrivial example we discuss a four-machine, two-area electric power system in which the tunable parameter is the gain constant of (one or two) PSS. (Received September 16, 2009)