1056-34-777 **Adam Fletcher Childers*** (`childers@roanoke.edu`), 1906 Arlington Rd., Roanoke, VA 24015.
Bounded Error Parameter Identification and the Design of Experiments for Models Described by Ordinary Differential Equations. Preliminary report.

In this paper we focus on the problem identifying parameters and designing experiments for non-linear dynamical systems in the case when the number of data samples is too small for standard statistical analysis. The models are described by ordinary differential equations with bounded errors. When the number of data samples is very small, standard parameter validation methods are not applicable because classical statistical asymptotic theory relies on the behavior of the estimated parameter as the number of samples grows large. We present a new computational method for parameter identification and show how it can be applied to the design of experiments problem for a specific class of models. Although the assumptions lead to a restricted class of models, the new parameter identification algorithm is computationally efficient for this class of problems. We introduce the basic ideas, provide some heretical results needed for the convergence of the parameter identification method and present numerical examples to illustrate how it can be applied to designing experiments. (Received September 17, 2009)