1107-65-469   **Matthias Chung**, **Justin Krueger*** (`kruegej2@vt.edu`) and **Mihai Pop**. *Robust Parameter Estimation for Differential Equation Models.* Preliminary report.

When using a traditional parameter estimation method to solve an inverse problem for a differential equation model, the method generally requires the repeated computation of the differential equation solution. This is a numerically intensive step in the parameter estimation process for multiple reasons, and avoiding it is desirable when possible. This preliminary report presents a new method for solving inverse problems involving differential equation models that avoids the calculation of the differential equation solution. Avoiding the differential equation solution makes this method more numerically robust, and the method achieves this robustness by defining a "nearby" inverse problem, which when solved provides parameter estimates suitable for the solution of the original inverse problem. The usefulness of this approach is most notable when applied to parameter estimation for large-scale differential equation models, which continue to grow in prevalence, such as those found in the main application for this research, quantifying the dynamics found in biological communities. (Received January 20, 2015)