1154-28-1927 **Troy Daniel Butler** (`troy.butler@ucdenver.edu`) and **Wenjuan Zhang*** (`wenjuan.zhang@ucdenver.edu`). *An Interactive Guide to Data-Consistent Solutions for Stochastic Inverse Problems, Part II: From (Potential) Chaos to Order.*

(Brief Note: We utilize Jupyter notebooks to re-create some of our published results in real-time, build a computational intuition, and aid in transparency and reproducibility.)

In part 2, we are motivated by practical issues involving the use of computationally expensive models to create a data-consistent solution to a stochastic inverse problem (SIP). Such models limit the number of times we may interrogate an accurate quantity of interest (QoI) map from input parameters to observable data.

We discuss the impact of using approximate QoI maps on the various measure structures associated on input and output spaces required to construct the data-consistent solution. A previous study focused on the special case where the approximate QoI maps converge essentially uniformly (i.e., in L^∞). We briefly review that work along with some of the numerical results before turning our attention to a unifying theory for cases involving QoI convergence in L^p for any $1 \leq p < \infty$. In particular, we consider polynomial chaos approximations to QoI maps and discuss the order of convergence of various densities used in constructing the data-consistent solution. Numerical examples illustrate various aspects of the theory. (Received September 16, 2019)