1125-62-2932 **Alen Alexanderian*** (alexanderian@ncsu.edu), alexanderian@ncsu.edu, and **Arvind K Saibaba**, asaibab@ncsu.edu. *Scalable algorithms for D-optimal design of experiments for large-scale Bayesian linear inverse problems.*

We address the problem of D-optimal experimental design for infinite-dimensional Bayesian linear inverse problems governed by PDEs. The goal is optimal placement of sensors where observational data is collected, so as to maximize the expected information gain. That is, we rely on a Bayesian D-optimal criterion, given by the expected Kullback-Leibler divergence from prior to posterior. In the infinite-dimensional Hilbert space setting, assuming Gaussian prior and noise models, the analytic expression for the resulting optimal experimental design (OED) objective function is given by the log-determinant of a perturbation of the identity by a prior-preconditioned data misfit Hessian operator. We introduce efficient randomized linear algebra methods to render the computation of OED objective function and its gradient tractable in large-scale applications. Numerical results illustrating our framework will be provided in the context of D-optimal sensor placement for reconstruction of initial concentration field in an advection-diffusion problem. (Received September 20, 2016)