1112-60-353 **James E Johndrow*** (james.johndrow@duke.edu), 211 Old Chemistry Building, Durham, NC 27713, and **Jonathan C Mattingly**, **Sayan Mukherjee** and **David B Dunson**.

Approximations of Markov Chains and High-Dimensional Bayesian Inference.

The Markov Chain Monte Carlo method is the dominant paradigm for posterior computation in Bayesian analysis. It has long been common to control computation time by making approximations to the Markov transition kernel. Comparatively little attention has been paid to convergence and estimation error in these approximating Markov Chains. We propose several frameworks for assessing when to use approximations in MCMC algorithms, and how much error in the transition kernel should be tolerated to obtain optimal estimation performance with respect to a specified loss function and computational budget. The results require only ergodicity of the exact kernel and control of the kernel approximation accuracy. The theoretical framework is applied to approximations based on random subsets of data, low-rank approximations of Gaussian processes, and a novel approximating Markov chain for discrete mixture models. (Received August 08, 2015)