Optimal Scaling of MCMC for Conditioned Diffusions

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I intend to outline a set of configurable methods for sampling conditioned diffusions. Conditions diffusions arise in many applications. Therefore it is important to understand how to optimise the efficiency of sampling methods. In particular, I am interested in the case where the drift dominates the noise.

To understand this issue, the methods are applied to the problem of sampling conditioned OU processes. The conditioned OU process is constructed with a single parameter, k, which governs the size of the drift. This effectively controls the difficulty of the sampling problem. This parameter is used to assess the algorithm efficiency of each of the proposed methods. I will outline how the optimal configuration of each algorithm is found as a function of k. Complementary theory and numerical results will be presented to substantiate the claims made. If time permits, results from other more complicated sampling problems will be presented.