

Variance reduction using nonreversible Langevin samplers

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A standard approach to computing expectations with respect to a given target measure is to introduce an overdamped Langevin equation which is reversible with respect to the target distribution, and to approximate the expectation by a time-averaging estimator. Introducing an appropriately chosen non-reversible component to the dynamics is beneficial, both in terms of reducing the asymptotic variance and of speeding up convergence to the target distribution. We will present results which quantify the sampling efficiency of non-reversible overdamped Langevin dynamics according to these two criteria: the speed of convergence to equilibrium and the asymptotic variance. Practical aspects will also be discussed.

Références

- [1] T. LELIVRE, F. NIER AND G. PAVLIOTIS, *Optimal non-reversible linear drift for the convergence to equilibrium of a diffusion*, Journal of Statistical Physics, 152(2), 237-274, 2013.
- [2] A.B. DUNCAN, T. LELIVRE AND G. PAVLIOTIS, *Variance reduction using nonreversible Langevin samplers*, Journal of Statistical Physic, accepted for publication, 2016.