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Positive Curvature and Hamiltonian Monte Carlo.

Recently, Joulin and Ollivier have defined a notion of curvature for Markov chains and have shown that one can obtain bounds on mixing times assuming that the curvature is always positive and bounded away from zero. In this talk, we apply their techniques to the setting of Hamiltonian Monte Carlo, a modification of the classical Metropolis-Hastings algorithm for sampling from a target distribution that sees more geometric information about the target distribution. We then show that, in several important cases in high dimensions, the curvature of a Hamiltonian Monte Carlo chain is positive. We thus obtain polynomial (in the dimension) mixing time bounds. (Received August 17, 2014)