

On the L^2 -mixing of normal Markov processes

Abstract

We consider the problem of proving the existence of an L^2 -cutoff for families of ergodic Markov processes started from given initial distributions and associated with normal Markov semigroups. This includes classical examples such as families of finite Markov chains and ergodic Markov processes on compact Riemannian manifolds. We give conditions that are equivalent to the existence of an L^2 -cutoff and describe the L^2 -cutoff time in terms of the spectral decomposition. This is illustrated by several examples including the Ehrenfest process and the biased (p, q) -random walk on the nonnegative integers, both started from an arbitrary point.