COALESCING RANDOM WALKS ON *n*-BLOCK MARKOV CHAINS

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ABSTRACT. For a finite state Markov chain M and a natural number n, the n-block Markov chain for M, denoted M_n , is obtained by recoding the trajectories of M using the n^{th} higher block code. On a Markov chain M, a coalescing random walk (CRW) is a stochastic process defined by two rules: particles move independently according to M until they "coalesce" (i.e. meet at the same state), and after coalescing, particles move together according to M. The coalescence time is the first time at which all particles have coalesced. We study coalescing random walks on the sequence of chains (M_n) , where M is a fixed, mixing Markov chain. In particular, we investigate the asymptotic behavior of the expected coalescence time is related to other important characteristics of M, such as its entropy.