



## ON THE CONVERGENCE OF DOUBLY STOCHASTIC MARKOV CHAINS

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**Abstract:** We characterize the asymptotic behavior of time-homogeneous doubly stochastic Markov chains. Our investigation revolves around understanding the dynamics of products of doubly stochastic matrices, which in turn allows us to fully characterize three distinct behaviors: cyclicity, convergence towards a special equilibrium matrix, and divergence. Notably, we introduce a novel and comprehensive sufficient condition for the convergence of an infinite product of doubly stochastic matrices.

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**Key words:** doubly stochastic matrices, Markov chains.