ON THE CONVERGENCE TO STATIONARITY OF BIRTH-DEATH PROCESSES

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Abstract

Taking up a recent proposal by Stadje and Parthasarathy in the setting of the many-server Poisson queue, we consider the integral $\int_0^\infty [\lim_{u\to\infty} E(X(u)) - E(X(t))]dt$ as a measure of the speed of convergence towards stationarity of the process $\{X(t),\ t \geq 0\}$, and evaluate the integral explicitly in terms of the parameters of the process in the case that $\{X(t),\ t \geq 0\}$ is an ergodic birth-death process on $\{0, 1, \ldots\}$ starting in 0. We also discuss the discrete-time counterpart of this result, and examine some specific examples.

BIRTH-DEATH PROCESS, SPEED OF CONVERGENCE

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