

MARKOV PROCESSES CONDITIONED TO NEVER EXIT A SUBSPACE OF
THE STATE SPACE

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Abstract: In this paper we study Markov processes never exiting (NE) a subspace A of the state space E or, in other words, Markov processes conditioned to stay in the subspace A . We show how the knowledge of the exact asymptotics of the tail distribution of the exit time helps to find the suitable exponential martingale, which, in turn, serves for the change of measure. Under the new probability measure the process is the sought for never exiting one the subspace A . We also find its extended generator and study relationships between the invariant measure (INE) and the quasi-stationary (QS) distribution. We analyze in detail the PDMP processes.

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Key words and phrases: Markov process, extended generator, exponential change of measure, piecewise deterministic Markov process, workload conditioned to stay positive, NE process, INE measure, quasi-stationary distribution.

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