Algebraic Characterization of Infinite Markov Chains Where Movement to the Right is Limited to one Step

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Abstract
We consider an infinite Markov chain with states $E_0, E_1, \ldots$, such that $E_1, E_2, \ldots$ is not closed, and for $i \geq 1$ movement to the right is limited by one step. Simple algebraic characterizations are given for persistency of all states, and, if $E_0$ is absorbing, simple expressions are given for the probabilities of staying forever among the transient states. Examples are furnished, and simple necessary conditions and sufficient conditions for the above characterizations are given.

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