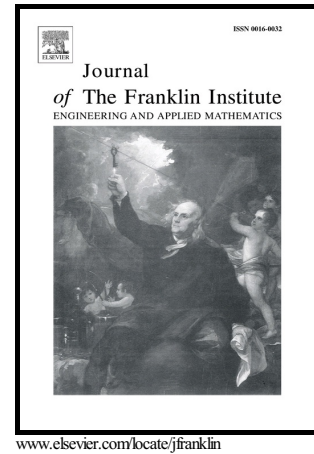


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# Positivity and stability of positive singular Markovian jump time-delay systems with partially unknown transition rates

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## Abstract

This paper is concerned with positivity and stochastic stability of a class of positive singular Markovian jump time-delay systems with partially unknown transition rates. First, a necessary and sufficient condition is established to check the positivity of singular Markovian jump time-delay systems. By constructing an appropriate linear co-positive Lyapunov-Krasovskii function, a sufficient condition of stochastic stability for positive singular Markovian jump time-delay systems is established, which can be solved in terms of linear programming. Based on the results obtained, we give a necessary and sufficient condition of stability for normal positive Markovian jump systems and build some relationships with some [existing](#) results. Finally, three numerical examples are used to demonstrate the effectiveness of the proposed results.

## Keywords:

linear programming, positive systems, partially unknown transition rates, singular Markovian jump time-delay systems, stochastic stability

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