

# Observer-based sliding mode mixed $H_2$ and passive control for Markovian jump system with mode-dependent time-varying delay

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## Abstract

This paper discusses mixed  $H_2$  and passive sliding mode control problem of uncertain Markovian jump system with one-sided Lipschitz non-linear and mode-dependent time-varying delay. The attractive point consist of the following. Firstly, by designing a suitable observer to estimate the unmeasurable state of the system. Secondly, based on a new mode-dependent Lyapunov-Krasovskii function, sufficient condition is established to ensure the stability of the closed-loop system. Thirdly, designing a suitable controller to guarantees reaches of predefined sliding mode surface. Finally, from the numerical examples, we can testify the effectiveness and less conservativeness of the theoretical method.

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