Partially commuting switched systems

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Talk Abstract

This work deals with the stability of switched systems that allow discontinuous jumps (resets) on certain state components during switching instants. If all state components are available in the reset application, the system can be effectively stabilized by selecting the appropriate resets. Stability may not be ensured, though, if some state components are forbidden from resetting. Using a partial state reset, we present a sufficient condition to ensure the stability of a switched system under any switching signal. We formulate this condition in terms of a block-simultaneous triangularizability requirement. According to this, we prove that a partial state reset can stabilize a class of systems with partially commuting stable system matrices. In addition, we propose an algorithm for enabling analysis to determine whether a switched system is one of this specific class.

Keywords: invariant subspace, partially commuting matrices, state reset, stability, switched system

Acknowledgements

This work has been partially supported by Center of Mathematics and Applications of University of Beira Interior (CMA-UBI) through the Portuguese Foundation for Science and Technology (FCT - Fundação para a Ciência e a Tecnologia), under the reference UIDB/00212/2020.

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