

Accepted Manuscript

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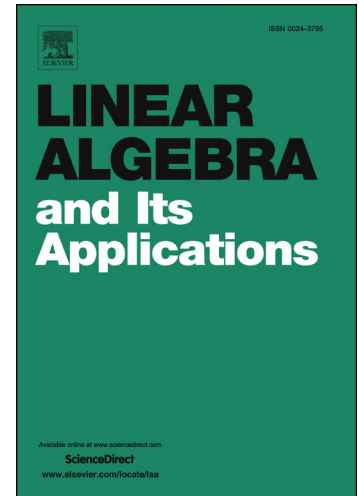
PII: S0024-3795(17)30570-0
DOI: <https://doi.org/10.1016/j.laa.2017.10.001>
Reference: LAA 14342

To appear in: *Linear Algebra and its Applications*

Received date: 11 February 2017
Accepted date: 2 October 2017

Please cite this article in press as: C. Wang, Y. Tao, Interval strong solutions of interval systems of max-plus linear equations, *Linear Algebra Appl.* (2017), <https://doi.org/10.1016/j.laa.2017.10.001>

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Interval strong solutions of interval systems of max-plus linear equations[☆]

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Abstract

This paper considers the existence and uniqueness of interval strong solutions of interval systems of max-plus linear equations. A necessary and sufficient condition for the existence of interval strong solutions is presented. The proof of the existence of interval strong solutions is constructive and results in a formula for computing such solutions. A necessary and sufficient condition for the uniqueness of interval strong solutions is established by testing the unique solvability of a finite number of subsystems rather than all subsystems. On this basis, a polynomial algorithm is developed to verify the uniqueness of interval strong solutions.

Keywords: Max-plus linear equations, interval system, strong solvability, interval strong solution, polynomial algorithm

2010 MSC: 15A06, 15A80, 65G30

1. Introduction

Max-plus algebra has a nice structure in which the max and plus operations are defined as the addition and multiplication in conventional algebra, respectively. A various of modeling, control and optimization
5 problems in some nonlinear time-evolution systems can be transformed into

[☆]This work was supported by National Natural Science Foundation of China under Grants 60774007 and 61305101.

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