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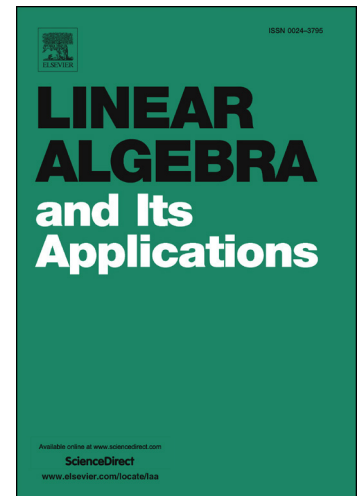
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Reachability of eigenspaces for interval circulant matrices in max-algebra

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Abstract

A nonnegative matrix A is said to be strongly robust if its max-algebraic eigencone is universally reachable, i.e., if the orbit of any initial vector ends up with a max-algebraic eigenvector of A . Consider the case when the initial vector is restricted to an interval and A can be any matrix from a given interval of nonnegative circulant matrices. The main aim of this paper is to classify and characterize the six types of interval robustness in this situation. This naturally leads us also to study the max-algebraic spectral theory of circulant matrices and the relation of inclusion between attraction cones of circulant matrices in max-algebra.

Keywords: Max-algebra, circulant matrices, interval analysis, reachability.

AMS classification: 15A18, 15A80, 65G40, 93C55

1. Introduction

Max-algebra has applications in such fields as discrete event systems and scheduling theory (among others) [2, 4, 11], and plays a crucial role in the study of discrete event systems in connection with optimization problems such as scheduling or project management in which the objective function depends on the maximum and times operations (or equivalently maximum and plus via a logarithmic transform). Notice that the main principle of

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