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化学数据库: Current Chemical Reactions (CCR-EXPANDED); Index Chemicus (IC)

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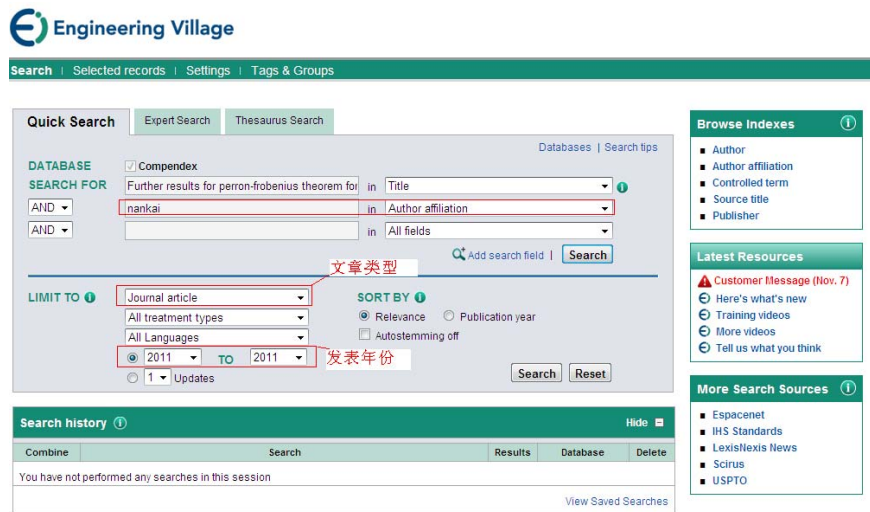
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classification codes

main heading

Detailed

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Accession number

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1.

Accession number: 20120514731624

Title: Further results for Perron-Frobenius theorem for nonnegative tensors II

Authors: Yang, Qingzhi<sup>1</sup> ✉, Yang, Yuning<sup>1</sup> ✉

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**Abstract:** For a nonnegative irreducible tensor, we give distribution properties of its eigenvalues. In particular, the spectral radius of a nonnegative irreducible tensor with positive trace is proved to be the unique eigenvalue on the spectral circle. Unlike the matrix setting, we give an example to present that this type of tensor is not always primitive. Thus, for a nonnegative irreducible tensor, the primitivity is a sufficient condition only for the spectral radius to be the unique eigenvalue on the spectral circle. Also, the stochastic tensor is defined, and we show that every nonnegative irreducible tensor with unit spectral radius is diagonally similar to a certain irreducible stochastic tensor. Based on this result, the minimax theorem for tensors is proved by using an alternative approach. Further, with the help of the minimax theorem, we illustrate that the problem of finding the spectral radius (largest singular value) of a nonnegative irreducible square (rectangular) tensor can be converted into a convex optimization problem. Additionally, we give an equivalent condition of irreducible nonnegative tensors. By this condition, one can easily determine whether or not a nonnegative tensor is irreducible. © 2011 Society for Industrial and Applied Mathematics.

Number of references: 22

Main heading: Tensors — 有该两项内容通常为Ei核心

Controlled terms: Convex optimization; Convex optimization problems; Convex programming; Eigen-value; Eigenvalues; Equivalent condition; Irreducible tensors; matrix; Minimax theorem; Perron-Frobenius theorem; Singular values; Spectral radii; Sufficient conditions

Uncontrolled terms: Alternative approach; Convex optimization problems; Convex programming; Eigen-value; Eigenvalues; Equivalent condition; Irreducible tensors; matrix; Minimax theorem; Perron-Frobenius theorem; Singular values; Spectral radii; Sufficient conditions

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