

Abstract

An m -order n -dimensional square real tensor \mathcal{A} is a multidimensional array of n^m elements of the form

$$\mathcal{A} = (A_{i_1 \dots i_m}), A_{i_1 \dots i_m} \in \mathbb{R}, 1 \leq i_1, \dots, i_m \leq n.$$

(A square matrix of order n is a 2-order n -dimensional square tensor.) An m -order n -dimensional square real tensor is said to be a nonnegative (positive) tensor if all its entries are nonnegative (positive). We shall discuss the Perron-Frobenius theory for nonnegative tensors and strict monotonicity of the spectral radius of some classes of nonnegative tensors. Using these results we establish some properties of \mathcal{M} -tensors. This is a joint work with Abraham Berman and Naomi Shaked-Monderer.