On the structure of a class of normal decomposition systems

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Abstract

A normal decomposition system (NDS) is connected with a decomposition statement for vectors of a linear space and with an inequality related to the decomposition. A typical example is the Singular Value Decomposition for matrices provided with the trace inequality of von Neumann. In the paper, we study the problem of generating such systems. The structure of a certain class of NDS is given. As a corollary, we show that the SVD and von Neumann inequality are implied by analogous results of Miranda and Thompson related to the special orthogonal group.

Keywords:
Normal decomposition system, Eaton triple, G-majorization, Group induced cone ordering, Finite reflection group, Singular value, Eigenvalue.

References: