

Convex Cones in Finite-Dimensional Real Vector Spaces

Milan Studený

Abstract: Various classes of finite-dimensional closed convex cones are studied. Equivalent characterizations of pointed cones, pyramids and rational pyramids are given. Special class of regular cones, corresponding to "continuous linear" quasiorderings of integer vectors is introduced and equivalently characterized. It comprehends both pointed cones and rational pyramids. Two different ways of determining of vector quasiorderings are dealt with: establishing (i.e. prescribing a set of 'positive' vectors) and inducing through scalar product. The existence of the least finite set of normalized integer vectors establishing every finitely establishable (or equivalently finitely inducible) ordering of integer vectors is shown. For every quasiordering of integer vectors established by a finite exhaustive set there exists the least finite set of normalized integer vectors inducing it and elements of this set can be distinguished by corresponding 'positive' integer vectors.

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