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The cone of quasi-semimetrics and exponent matrices of tiled orders. (English) Zbl 07414977

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Summary: Finite quasi semimetrics on \( n \) can be thought of as nonnegative valuations on the edges of a complete directed graph on \( n \) vertices satisfying all possible triangle inequalities. They comprise a polyhedral cone whose symmetry groups were studied for small \( n \) by Deza, Dutour and Panteleeva. We show that the symmetry and combinatorial symmetry groups are as they conjectured.

Integral quasi semimetrics have a special place in the theory of tiled orders, being known as exponent matrices, and can be viewed as monoids under componentwise maximum; we provide a novel derivation of the automorphism group of that monoid. Some of these results follow from more general consideration of polyhedral cones that are closed under componentwise maximum.

MSC:

16Hxx  Associative algebras and orders
05Cxx  Graph theory

Keywords:
quasi-semimetric; polyhedral cone; exponent matrix; face lattice; symmetry; max-plus algebra

References:


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