Polyhedral Computations
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Polyhedra With Symmetries in the Geometry of Numbers

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Abstract

We show some applications of vertex/ray enumeration in the Geometry of Numbers. For example, the computation of vertices of the Dirichlet-Voronoi-cell of a lattice yields the inhomogeneous minimum and allows to compute its quantizer constant. We show that the classical problem of determining the Hermite constant (densest lattice sphere packing) can be solved using vertex enumeration. In all these cases, the most interesting or critical examples have many symmetries. We therefore briefly discuss some approaches to enumerate vertices up to symmetries. The talk is complemented by the talk of Mathieu Dutour Siciric about the Adjacency Decomposition Method, which has been applied in practice quite successfully.