Polyhedral Computations
October, 17–20, 2006

Polytopes and arrangements: diameter and curvature

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Abstract

By analogy with the conjecture of Hirsch, we conjecture that the order of the largest total curvature of the central path associated to a polytope is the number of inequalities defining the polytope. By analogy with a result of Dedieu, Malajovich and Shub, we conjecture that the average diameter of a bounded cell of an arrangement is less than the dimension. We substantiate these conjectures in low dimensions, highlight additional links, and prove a continuous analogue of the d-step conjecture.

Joint work with Tamas Terlaky and Yuriy Zinchenko.