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The Acyclotope and Hyperplanes of a Graph

Abstract for the Combinatorics Seminar 2015 May 8 (Note special day)

The acyclotope of a graph G can be defined as the convex hull of the net degree vectors (indegree – outdegree) of all acyclic orientations of G , or as the Minkowski sum of line segments representing G . (Thus, it is a zonotope; Postnikov calls it the “graphical zonotope”. The line segments are dual to the hyperplanes of the graphic arrangement of G .) I introduced the acyclotope (or at least the name) about 37 1/2 years ago in connection with signed graphs. It was perhaps inspired by the score vectors of tournaments, which are a special case that is closely related to the permutahedron. I will discuss its notable properties.

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Last update: **2020/01/29 19:03**

