

THE UNIVERSITY



OF HONG KONG

*Institute of Mathematical Research
Department of Mathematics*

GEOMETRY SEMINAR

Tropical polyhedra and spectrahedra

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Abstract

Some classical results in tropical geometry provide a combinatorial description of the images by the nonarchimedean valuation of algebraic sets over nonarchimedean fields, such as fields of Puiseux series. We shall show here how some of these results carry over to classes of convex semi-algebraic sets, including tropical polyhedra, and more generally, tropical spectrahedra. The latter are the images by the valuation of nonarchimedean spectrahedra, i.e. of sets defined by a linear matrix inequality over a real closed nonarchimedean field. We shall give an overview of combinatorial results concerning tropical polyhedra and spectrahedra, including external representations, and the equivalence with zero-sum games.

This survey is based on a series of works with several authors, Akian, Allamigeon, Benchimol, Guterman, Joswig and Skomra. Some of the latest results discussed here, on tropical spectrahedra, are taken from: X. Allamigeon, S. Gaubert, and M. Skomra. Solving generic nonarchimedean semidefinite programs using stochastic game algorithms, Proc. of ISSAC, 2016, arXiv: 1603.06916

Date: August 25, 2016 (Thursday)

Time: 4:00 – 5:00pm

Place: Room 309, Run Run Shaw Bldg., HKU

All are welcome