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Tropical Discriminants

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ABSTRACT

We present a new approach to the theory of A -discriminants of Gelfand, Kapranov and Zelevinsky by using tropical geometry. For an integer matrix A , the tropical A -discriminant coincides with the Minkowski sum of the row space of A and the Bergman fan of the kernel of A . Hence, Bergman fans and their nested set subdivisions play a crucial role, both from a conceptual and from a computational point of view.

Using our tropical approach, we obtain a positive formula for the extreme monomials of any A -discriminant, and, building on an interpretation of tropical discriminants in terms of regular polyhedral subdivisions of point configurations, we give a combinatorial characterization of Δ -equivalence for regular triangulations.

This is joint work with Alicia Dickenstein and Bernd Sturmfels.