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Tropical geometry and scheme theory

Abstract

Tropical geometry has traditionally been seen as a combinatorial piecewise linear shadow of algebraic geometry, and form the beginning the field was guided by a heuristic view of tropical varieties as objects defined over the idempotent semiring given by the real line with the max-plus operations. A few years ago this heuristic began to transform into a reality based on the extensions of scheme theory motivated by geometry over the field with one element. In this talk I will explain what we know about the very special class of systems of equations that describe tropical varieties - they possess a matroidal structure - and I will give a tour of what is known and what is not yet known about these systems of tropical equations. This is the summation of work by Noah Giansiracusa, myself, Felipe Rincon, Diane Maclagan and Alex Fink.