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Tropicalizing o-minimal definable sets

Abstract: In this talk, we discuss several equivalent descriptions of the tropicalization of definable sets in a polynomially bounded o-minimal expansion of a real closed field. We show that the tropicalization can be described in multiple ways: as the image under the valuation map, as the image under the tropicalization map of the Archimedean points in the o-minimal spectrum, in terms of initial degenerations of the definable set and initial nonnegativity cones, or via the signed tropicalization of polynomials belonging to the corresponding nonnegativity cone. Moreover, we prove analogous results for the fine tropicalization, where the valuation map is replaced by the RV sort map, which records not only the valuation of a point but also its angular component.