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From weakly separated collections to matroid subdivisions

We study arrangements of slightly skewed tropical hyperplanes, called blades, on the vertices of a hypersimplex $\Delta_{k,n}$. We reformulate the condition under which such an arrangement induces a matroid (in fact a positroid) subdivision as the requirement that the collection of vertices must satisfy pairwise a certain non-crossing condition on a chord diagram: pairs of vertices should be weakly separated. This work is motivated in part by recent joint work together with Cachazo, Guevara and Mizera, where a formulation was proposed for quantum field theory over $\mathbb{CP}^{k-1}$.

This talk is based on preprints 1910.11522 and 1810.03246.