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Root polytopes, tropical types, and toric edge ideals

We explore generic tropical hyperplane arrangements where some of the apices of the tropical hyperplanes are "taken to infinity." We show that the resulting bounded complex gives rise to a cellular resolution for an ideal that is Alexander dual to the Stanley-Reisner ideal of a regular triangulation of a root polytope. Moreover, the Stanley-Reisner ideal of this triangulation can be seen as a squarefree initial ideal of a toric edge ideal of a bipartite graph; this key observation yields a new approach to studying homological aspects of toric edge ideals of bipartite graphs. This is joint work with Anton Dochtermann (Texas State) and Ben Smith (Manchester).