1 On Kleene stars and intersection of finitely generated semimodules

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It is known that Kleene stars are fundamental objects in max-algebra and in other algebraic structures with idempotent addition. They play important role in solving classical problems in the spectral theory, and also in other respects. On the other hand, the approach of tropical convexity puts forward the tropical cellular decomposition, meaning that any tropical polytope (i.e., finitely generated semimodule) can be cut into a finite number of convex pieces, and subsequently treated as a cellular complex. We show that any convex piece of this complex is max-algebraic column span of a uniquely defined Kleene star. We provide some evidence that the tropical cellular decomposition can be used as a purely max-algebraic tool, with the main focus on the problem of finding a point in the intersection of several finitely generated semimodules.