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**Susan Cooper, Sabine El Khoury\*** (se24@aub.edu.lb), **Sara Faridi, Sarah Mayes-Tang, Susan Morey, Liana Sega** and **Sandra Spiroff**. *Cellular resolutions of powers of ideals of projective dimension 1, Part I.*

One of the most fruitful directions in the study of monomial ideals is finding topological objects whose chain maps can be adapted to a free resolution of the ideal. While such resolutions exist for any monomial ideal (with Taylor's resolution being the starting example), they are mostly non-minimal. A square-free monomial ideal  $I$  of projective dimension one is known to have a minimal resolution supported on a (graph) tree  $G$ . Starting with this tree, we construct for any  $r > 0$  a polyhedral cell complex  $\overline{G^r}$ , with vertices labeled by a set of monomials that minimally generate  $I^r$ . In this talk, we give a concrete geometric description of  $\overline{G^r}$  and we describe the homogenized chain complex associated with it. The second part of this talk will show that this chain complex is a minimal free resolution of  $I^r$ .

Both parts of this talk are part of a project that was started during a "Women in Commutative Algebra" meeting in Banff, which also includes the material to be presented in the following talk in the session "Free Resolutions, Combinatorics, and Geometry":

Morse resolutions of powers of square-free monomial ideals of projective dimension 1 (Sara Faridi). (Received August 03, 2020)