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Susan Cooper, Sabine El Khoury, Sara Faridi* (faridi@dal.ca), **Sarah Mayes-Tang, Susan Morey, Liana Sega** and **Sandra Spiroff**. *Morse resolutions of powers of square free monomial ideals of projective dimension 1*. Preliminary report.

A monomial ideal I is said to have a free resolution supported on a simplicial or cellular complex Δ if the topological chain complex of Δ can be homogenized, using the generators of I , to give a free resolution of I . For example, the Taylor resolution is a simplex on q vertices supporting a free resolution of any monomial ideal with q generators.

It is known that if I is a monomial ideal of projective dimension 1, then it has a minimal free resolution supported on a one-dimensional simplicial complex: a graph which is a tree. In this talk, using discrete Morse theory, we will show that all powers of I have resolutions supported on a CW complex, when I is a square-free monomial ideal.

We will explain the basic ideas behind discrete Morse theory and the construction of the CW complex.

This talk is part of a project that was started during a "Women in Commutative Algebra" meeting in Banff in 2019, and is directly related to the two talks below which will be given in the session "Commutative Algebra" by collaborators:

Cellular resolutions of powers of ideals of projective dimension 1, Part I (Sabine El Khoury);

Cellular resolutions of powers of ideals of projective dimension 1, Part II (Liana Sega). (Received July 31, 2020)