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**Susan M. Cooper\*** ([susan.cooper@umanitoba.ca](mailto:susan.cooper@umanitoba.ca)), Department of Mathematics, 476 Machray Hall, 186 Dysart Road, University of Manitoba, Winnipeg, MB R3T 2N2, Canada, and **Sabine El Khoury, Sara Faridi, Sarah Mayes-Tang, Susan Morey, Liana Segal and Sandra Spiroff.** *Simplicial Resolutions and Powers of Monomial Ideals.* Preliminary report.

In 1966 Diana Taylor established a method to construct a free resolution of an ideal  $I$  generated by  $p$  monomials using the simplicial chain maps of a simplex on  $p$  vertices. Work of Bayer, Peeva and Sturmfels later extended Taylor's work to show that as long as such a simplicial complex satisfies certain homological conditions, it can support a free resolution of  $I$ .

In this talk we construct a family of simplicial complexes where the 2nd complex in the family supports a free resolution of the second power  $I^2$  for  $I$  a square-free monomial ideal. We will also discuss the generalization of our work to higher powers of  $I$ . This project stems from work initiated at a BIRS "Women in Commutative Algebra" meeting in Fall 2019. (Received January 15, 2021)