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**Selvi Kara\*** ([selvi@southalabama.edu](mailto:selvi@southalabama.edu)), 411 N. University Blvd, Mobile, AL 36688. *On algebraic and combinatorial properties of weighted simplicial complexes.*

Weighted simplicial complexes (WSCs) are powerful tools for describing weighted cloud data or networks with weighted nodes. In this paper, we propose a novel approach to study WSCs via the concept of polarization. Polarization of a WSC allows one to construct a new (unweighted) simplicial complex which coincides with an object called the mixed wreath product. This new construction preserves several properties and invariants of the underlying simplicial complex of a WSC. Our main focus is to analyze WSCs through their underlying simplicial complexes and mixed wreath products. Combinatorially, we investigate properties such as vertex-decomposability, shellability, constructibility; algebraically, we study Betti numbers, associated primes and primary decompositions of ideals associated to WSCs. (Received January 05, 2021)