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Colorings of simplicial complexes and vertex decomposability

In attempting to understand how combinatorial modifications alter algebraic properties of monomial ideals, several authors have investigated the process of adding “whiskers” to graphs. In this paper, we study a similar construction to build a simplicial complex Δ_χ from a coloring χ of a subset of the vertices of Δ , and give necessary and sufficient conditions for this construction to produce vertex decomposable simplicial complexes. We apply this work to strengthen and give new proofs about sequentially Cohen-Macaulay edge ideals of graphs.