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The GVD property of toric edge ideals and binomial edge ideals

Geometrically vertex decomposable (GVD) ideals form a class of ideals that generalize the Stanley-Reisner ideals of vertex decomposable simplicial complexes. Recent work has investigated the GVD property in the context of toric ideals of graphs. In this setting, several families of graphs with GVD toric ideals have been identified, as well as connections between the GVD property and other algebraic invariants. However, a complete characterization of GVD toric ideals remains unknown. In this talk, we present a new family of graphs whose toric ideals are GVD. We also initiate a study of the analogous problem for binomial edge ideals, and describe two families of graphs whose binomial edge ideals are GVD. We show that all Cohen-Macaulay binomial edge ideals for graphs with fewer than 12 vertices are GVD, and make a conjecture about the occurrence of such ideals for larger graphs. This talk is based on joint work with Adam Van Tuyl and Sasha Zotine, and work in progress with Akihiro Higashitani, Lisa Seccia, and Adam Van Tuyl.