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*Computing projective dimension of monomial ideals via associated hypergraphs and lcm-lattices*

Given a square-free monomial ideal  $I$  in a polynomial ring  $R$  over a field  $k$ , we would like to know the projective dimension of  $I$ . We recall the definition of the lcm-lattice of a monomial ideal introduced by Gasharov, Peeva and Welker, and the definition of the dual hypergraph of a square-free monomial ideal introduced by Kimura, Terai and Yoshida. Our work focuses on the relationship between the lcm-lattice and the dual hypergraph of a given square-free monomial ideal. We use the properties of lcm-lattice to find whether two different dual hypergraphs have the same projective dimension, and thus are able to extend some of the results by Lin and Mantero which compute the projective dimensions for ideals with certain hypergraphs. This is joint work with Kuei-Nuan Lin.