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Gotzmann squarefree monomial ideals

Let $S = \mathbb{k}[x_1, \dots, x_n]$ be the polynomial ring and $R = S/(x_1^2, \dots, x_n^2)$ be the Kruskal-Katona ring. A homogeneous ideal $I \subset S$ (or R) is called Gotzmann if each graded component has the smallest possible Hilbert function given its number of generators. Gotzmann squarefree monomial ideals I of S can be classified using properties of IR . Though the problem of classifying Gotzmann monomial ideals of R seems more difficult, certain decomposition and reconstruction results can be given. Gotzmann ideals have a number of nice algebraic properties and Gotzmann monomial ideals of R arise in interesting combinatorial problems. This is joint work with Jeff Mermin.