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Title: Linkage, Lefschetz, and Quadratic Gorenstein Non-Koszul algebras (joint with M. Mastroeni, M. Stillman).

Abstract:

In a pair of recent papers, we construct Gorenstein Quadratic Non-Koszul (GQNK) algebras, one family via idealization, a second family via inverse systems. The idealization approach requires as input an Artinian QNK algebra A which is super level. When F is a Lefschetz element on a complete intersection $C \subseteq S = k[x_1, \dots, x_n]$ generated in degree d , the almost complete Intersection $A = C + \langle F \rangle$ is linked to a Gorenstein ideal, and when n and d are both even, we construct the entire free resolution of both A and G . As to the question of when such a Lefschetz element exists, for $S = k[x_1 \dots x_n, y_1 \dots y_n]$ and C consisting of the squares of variables, results of Conca-Herbig-Iyengar show that $F = \sum x_i y_i$ is Lefschetz. Our results proves that the resulting almost complete intersection A is super level, whose idealization is a GQNK algebra.