

The Weak Lefschetz Property of quotient of Stanley-Reisner ring by squares of all variables

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Let Δ be an (abstract) simplicial complex on n vertices. Consider the Artinian monomial algebra $A(\Delta) = \mathbb{k}[x_1, \dots, x_n] / \langle x_1^2, \dots, x_n^2, I_\Delta \rangle$ where I_Δ is the Stanley-Reisner ideal associated to Δ and $\mathbb{k}$ is a field of characteristic 0. In this talk, we explore some characterizations of the Weak Lefschetz Property (WLP) of $A(\Delta)$ in terms of the simplicial complex Δ . We give a complete characterization of all 2-dimensional pseudomanifolds Δ such that $A(\Delta)$ satisfy the WLP and also construct a family of Artinian Gorenstein algebras that fail the WLP by combining our results and the standard technique of Nagata idealization. The talk is based on a joint work with Hailong Dao.

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