

Enumerations deciding the Weak Lefschetz Property

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We present joint work with David Cook II.

We discuss an approach for studying monomial ideals in three variables via lozenge tilings of certain planar regions. It provides combinatorial interpretations for the weak Lefschetz property and the semistability of syzygy bundles. As a consequence, the presence of the weak Lefschetz property can be decided and the splitting type of syzygy bundles can be determined in new cases. Attention is also given to ground fields of positive characteristic.