The base ring associated to a transversal polymatroid

Alin ŞTEFAN

Abstract - An interesting area of combinatorics is represented by the matroid theory, introduced by Whitney in 1935. This theory was further developed by Edmonds, who introduced in 1970 the polymatroids. The case of discrete polymatroids was studied by Herzog and Hibi in 2002. They showed that the base rings associated to discrete polymatroids are Cohen-Macaulay and they distinguished a special case of discrete polymatroids, the so-called transversal polymatroids. In this paper, the principal tool to describe transversal polymatroids with Gorenstein base ring is the polyhedral geometry, especially the Danilov-Stanley theorem for the characterization of canonical module.

Key words and phrases : Base ring, discrete and transversal polymatroid, equations of a cone, a-invariant, canonical module, Hilbert series.

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