

Dihedral Galois covers of algebraic varieties and the simple cases

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Abstract

A dihedral (Galois) cover of an algebraic variety Y is a Galois cover of Y with group a dihedral group. I will report on a joint work with Fabrizio Catanese where we investigate the algebra and geometry of dihedral covers of smooth algebraic varieties. We provide a structure theorem for dihedral covers, that is, given a smooth variety Y , we describe the algebraic “building data” on Y which are equivalent to the existence of such covers $\pi: X \rightarrow Y$. This is given in terms of line bundles on Y and divisorial sheaves on normal double covers of Y . Applications of this structure theorem in concrete cases rely on the explicit knowledge of the group of divisorial sheaves on such double covers of Y , for this reason we provide a description of this group in terms of rank 2 vector bundles on Y . Finally, we introduce two special very explicit classes of dihedral covers: the simple and the almost simple dihedral covers, and we determine their basic invariants. For the simple dihedral covers we also determine their natural deformations. We also give applications to fundamental groups of complements of divisors.