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Characteristic classes of singular varieties and motivic theory

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ABSTRACT

This is a joint work with Jörg Schürmann (Münster) and Shoji Yokura (Kagoshima).

The Hirzebruch theory unifies the three theories of characteristic classes: Chern, Todd and Thom-Hirzebruch classes, whose degree zero components are respectively Euler-Poincaré characteristic, arithmetic (or Todd) genus and the signature. In the case of a singular algebraic complex variety, there are no characteristic classes in cohomology anymore, but classes in homology. The three theories are generalised by the (homology) transformations of Schwartz-MacPherson, Baum-Fulton-MacPherson and Cappell-Shaneson respectively. The problem is that these transformations are defined on different spaces. Using the motivic theory, more precisely the Grothendieck relative group of algebraic varieties over the algebraic variety, one can unify the three transformations.