

The morphic Abel–Jacobi map

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Abstract

The morphic Abel–Jacobi map for complex varieties is defined, in analogy with the classical Abel–Jacobi map, by replacing singular (co)homology with the Bloch–Ogus twisted duality theory formed by morphic cohomology and Lawson homology. It is thus a map defined on the group of cycles on a smooth projective complex variety that are algebraically equivalent to zero, taking values in certain “generalized Jacobians” formed from the mixed Hodge structure possessed by morphic cohomology.

In this talk, I describe the construction of the morphic Abel–Jacobi map and the basic properties it enjoys. I also discuss what it tells us about the connection between the group of cycles algebraically equivalent to zero and morphic cohomology. For example, assuming some conjectures, the morphic Abel–Jacobi map relates “finite dimensionality” of the group of cycles algebraically equivalent to zero modulo linear equivalence to finite generation of certain morphic groups.

Some of the results discussed in this talk come from joint work with Eric Friedlander and Christian Haesemeyer.