The geometry of holomorphic and algebraic curves in
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Real regulators on Milnor complexes and the Mumford-Manin conjecture revisited

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Abstract

Let X be a projective algebraic manifold. For integers $k, m \geq 0$ we consider a cycle group $\mathrm{CH}^k_{\mathrm{M}}(X, m)$ defined in terms of the Zariski cohomology of the sheaf of Milnor K-groups on X, and a corresponding twisted variant $\mathrm{CH}^k_{\mathrm{TM}}(X, m)$. We construct real logarithmic type maps ("real regulators") on $\mathrm{CH}^k_{(\mathrm{TM})}(X, m)$ with values in Hodge cohomology, and as an example in the case $k = m = 2$ and X a curve, we deduce a weak version of the Mumford-Manin conjecture. In cases where the regulator image of $\mathrm{CH}^k_{\mathrm{M}}(X, m)$ is "trivial" it can be shown that the regulator image of $\mathrm{CH}^k_{\mathrm{TM}}(X, m)$ can be nontrivial.