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47408. *Motivic Zeta-Functions for Curves with Group Actions.*

If C is a curve of genus g , the motivic zeta-function for C is a formal power series $\sum [Sym^n C] t^n$ with coefficients in the Grothendieck ring for varieties. Kapranov proved a generalized Weil's first conjecture for curves by proving the rationality of motivic zeta-functions for curves.

Now consider a variety, X , with an algebraic group, G , acting on it. In this paper, we will define the Grothendieck ring and motivic zeta-functions for varieties with G -actions. It turns out that convenient properties, like the fact that a fiber bundle can be written as a product in the Grothendieck ring, are no longer true except in special situations. This makes investigating the rationality of the motivic zeta-functions for curves with G -actions more difficult than in the classical problem. Despite this, the main goal of this paper is to prove the rationality of motivic zeta-functions for curves with finite abelian group actions. (Received September 05, 2008)