Cohomologies of p-group covers

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ABSTRACT

Studying cohomology of a variety with an action of a finite group is a classical and well-researched topic. However, most of the previous results focus either on the tame ramification case, on some special groups, or on specific curves. In the talk, I will consider the case of a curve over a field of characteristic p with an action of a finite p-group. My research suggests that the Hodge and de Rham cohomologies decompose as sums of certain 'local' and 'global' parts. The global part should be determined by the 'topology' of the cover, while the local parts should depend only on an analytical neighborhood of the fixed points of the action. In fact, the local parts should come from cohomologies of Harbater-Katz-Gabber curves, i.e. covers of the projective line ramified only over ∞. During the talk, I will present new progress related to this conjecture and present some applications.