

Groups, graphs and everything in between

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Title: Automorphism Groups of Curves in Positive Characteristic

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Abstract: In recent years, some new ideas have been developed in the study of the automorphism groups of algebraic curves defined over a finite field. The main goal has been to find a way to apply deeper results from finite group theory, in accordance with the various constraints arising from the requirement that a group be an automorphism group of a given curve. Such constraints concern both the structure and the action (as a permutation group) of the group on the points of the curve. This has made it possible to understand better the structure and action of the groups acting as automorphism groups on a curve in the case where the order of the group is large enough compared with the genus of the curve. In this survey we focus on the following issues:

- Examples of curves whose automorphism groups have a 2-transitive orbit;
- Upper bounds on the order of automorphism groups depending on the genus of the curve;
- Improvement for curves with positive Hasse-Witt invariant.
- The case where the genus of the curve is even.