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Anne M. Ho* (aho@coastal.edu). *Artin-Schreier Curves and Orbits of n -sets under $\mathrm{PGL}_2(k)$* . Preliminary report.

Let C be an Artin-Schreier curve of genus g over a finite field $k := \mathbb{F}_q$ of characteristic p . A number of authors have considered a weighted sum of C using the automorphism group of C over k , mostly in the cases when $p = 2$. For odd p , we consider a closely related weighted sum for C over finite fields of all characteristics p . Each Artin-Schreier curve C has an associated rational equation $y^p - y = u(x)$ for $u(x) \in k(x)$ with a set of n poles. In the process of determining the weighted sums, we consider the action of $\mathrm{PGL}_2(k)$ on these rational equations and their poles. In particular, the number of orbits of these n -sets is known if the field of definition is k (López and Nart), and we find the number of orbits for appropriate field extensions of k in our cases. (Received September 15, 2015)