

ON THE TORSION OF THE JACOBIANS OF SUPERELLIPTIC CURVES $y^q = x^p + a$

Tomasz Jędrzejak
University of Szczecin (Szczecin, Poland)

Consider the family of superelliptic curves (over \mathbb{Q}) $C_{q,p,a} : y^q = x^p + a$, and its Jacobians $J_{q,p,a}$, where $2 < q < p$ are primes. I will give the full (resp. partial) characterization of the torsion part of $J_{3,5,a}(\mathbb{Q})$ (resp. $J_{q,p,a}(\mathbb{Q})$). The main tools are computations of the zeta function of $C_{3,5,a}$ (resp. $C_{q,p,a}$) over \mathbb{F}_l for primes $l \equiv 1, 2, 4, 8, 11 \pmod{15}$ (resp. for primes $l \equiv -1 \pmod{qp}$) and applications of the Chebotarev Density Theorem.