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Section:

11. Mathematical Physics

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Siegel's Lemma, Padé Approximations and Jacobians

(Joint work with Enrico Bombieri.) Let C be a non-singular positive genus projective curve over a number field K. Let $K(C) = K(x, y)$ for rational functions x, y with x non-constant of degree n. Assume $x^{-1}(0)$ has n distinct points $Q_1, \ldots, Q_n$ and fix $Q \in x^{-1}(0)$. Then y can be chosen as a local uniformiser at Q with a unique branch $u(x)$ at $(0, 0)$. We show that the growth of the height of classical Padé approximation polynomials for $(1, u(x), \ldots, u(x)^{n-1})$ as a function of their degree is large if the rational equivalence class of the divisor $nQ - (Q_1 + Q_2 + \ldots + Q_n)$ is not a torsion point of the Jacobian of C. This reproves and generalises results of D. V. and G. V. Chudnovsky for elliptic curves.

Reference: E. Bombieri, and P. B. Cohen, with Appendix by U. Zannier, Siegel's Lemma, *Padé Approximations and Jacobians*, to appear in the De Giorgi volume, Annali Scuola Normale Superiore, Pisa.