Plane Quartic Twists of $X(5, 3)$

Dedicated to Pilar Bayer on her sixtieth birthday

Julio Fernández, Josep González and Joan-C. Lario

Abstract. Given an odd surjective Galois representation $\rho: G_{\mathbb{Q}} \to \operatorname{PGL}_2(F_3)$ and a positive integer $N$, there exists a twisted modular curve $X(N, 3)_\rho$ defined over $\mathbb{Q}$ whose rational points classify the quadratic $\mathbb{Q}$-curves of degree $N$ realizing $\rho$. This paper gives a method to provide an explicit plane quartic model for this curve in the genus-three case $N = 5$. 

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