

On the genus of Holm's curve over finite field

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Abstract. Let F_q be a finite field of order q , (q is a power of a prime p), and \mathcal{K} be an algebraically closed field extension of F_q . Consider the elliptic curve $H_\lambda = f(y) - \lambda f(x)$ where $f(t) = t^3 - t \in F_q[t]$, $\lambda \in F_q^* \in$, and $\lambda^3 \neq 1$, introduced by Alexandar Holm known as Holm's Curve [4], [6]. In this paper, we first determine the singularities of H_λ when $f(t)$ is a monic polynomial in general form of degree $n \geq 2$ with coefficients in F_q and $\lambda \in \mathcal{K}^*$ such that $\lambda^n \neq 1$ and then we make a study of the genus of irreducible curve H_λ .

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