

2010年度 第13回の整数論セミナー

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タイトル：3-torsion of the Jacobian of curves of genus 2 and a certain family of elliptic threefolds.

アブストラクト：

Let C be a curve of genus 2 defined by $y^2 = f(x)$, where $f(x)$ is a polynomial of degree 5 or 6 without multiple roots. We would like to construct a family of C such that all the 3-torsion points of $J(C)$ are defined over $k(\sqrt{-3})$. To do so, we consider the elliptic surface defined by the Weierstrass equation $E : Y^2 = X^3 + f(x)$. This is a rational elliptic surface whose Mordell-Weil lattice is isomorphic to the root lattice of type E_8 . Using a recent result of Remke Kloosterman on the elliptic threefolds of the form $Y^2 = X^3 + g(s, t)$, we construct a three parameter family of elliptic surfaces E whose Mordell-Weil lattice is defined over $k(\sqrt{-3})$, and thus we obtain a three parameter family of C such that $J(C)[3]$ is defined over $k(\sqrt{-3})$.