Theorem: Let $S$ be a finite set of places of $Q$ containing 2, $\infty$. For each $i=1,\ldots,4$, let $c_i,d_i \in Z_S$ be a pair of $\text{S}$-co-prime $\text{S}$-integers such that $\Delta_{i,j} := c_i d_i - c_j d_j$ is non-zero for $i \neq j \in \{1,\ldots,4\}$. Let $\mathcal{Y} \rightarrow \mathbb{P}^1_S$ be the pencil of affine conics determined inside $\mathcal{O}(\mathcal{S}) \oplus \mathcal{O}(\mathcal{S})^{-1}$ by an equation of the form

$$(c_1 t + d_1 s)(c_3 t + d_3 s)x^2 + (c_2 t + d_2 s)(c_4 t + d_4 s)y^2 = 1.$$ 

Assume that the classes $[-1], [\Delta_{1,2}], [\Delta_{1,4}], [\Delta_{2,3}], [\Delta_{2,4}], [\Delta_{3,4}]$ are distinct linearly independent classes in $Q^*/(Q^*)^2$. Then $\mathcal{Y}$ has an $S$-integral point.

Examples of $\mathcal{Y}$ include log K3 surfaces. The method used in this paper is the integral descent-fibration method, which is an extension of the fibration-method originally developed by Swinnerton-Dyer.

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110999 Arithmetic algebraic geometry (Diophantine geometry)
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References:


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