Computing Mordell-Weil ranks of cyclic covers of elliptic surfaces

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Abstract. We consider elliptic surfaces of the form $Y^2 = X^3 + A(t^r)X + B(t^r)$, where $A(t)$ and $B(t)$ are polynomials and r is a positive integer. We show how to compute the ranks of these elliptic surfaces in several examples.