Fibonacci numbers of the form $x^a \pm x^b \pm 1$

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Abstract

Fibonacci numbers $(F_n)_{n\geq 0}$ given by $F_0 = 0, F_1 = 1$ and $F_{n+2} = F_n + F_{n+1}$ for $n \geq 0$ is the most well known and widely studied recurrence sequence. A recent breakthrough result of Bugeaud, Mignotte and Siksek states that Fibonacci numbers are perfect powers only for $F_0 = 0, F_1 = 1, F_2 = 1, F_6 = 8$ and $F_{12} = 144$. In this talk, we show that a related diophantine equation $F_n = x^a \pm x^b \pm 1$ has only finitely many positive integer solutions (n, x, a, b) with $\max\{a, b\} \geq 2$ and x having exactly two distinct prime factors. This is a joint work with F. Luca.