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Definition and first properties of Markov polynomials

The sequence of Markov numbers (A002559 in the OEIS)

$$1, 2, 5, 13, 29, 34, 89, 169, \ldots$$

is generated from the integral solutions of Markov's equation $x^2 + y^2 + z^2 = 3xyz$. In this talk, we define a sequence of polynomials over a finite field $\mathbb{F}_q$, with $q \equiv 1 \mod 4$, which is analogous to the sequence of Markov numbers. We discuss some recently discovered and conjectured properties of these so-called Markov polynomials.