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On a conjecture of Golomb and Moreno

A polynomial f over a finite field with $f(0) = 0$ and $f(xd) - f(x)$ being a permutation for all $d \neq 1$ is a *Costas polynomial*. Costas polynomials are semi-multiplicative analogues of *planar functions*. The Golomb-Moreno conjecture states that a Costas polynomial over a prime field is a monomial.

In this talk, we draw connections between Costas polynomials and related combinatorial objects. We also give a partial proof of the Golomb-Moreno conjecture: we show that $3/4$ of the terms of a Costas polynomial must equal 0. We also give an equivalent conjecture in terms of the number of *moved* elements of the field under f .