Hutz, Benjamin; Patel, Teerth
Periodic points and tail lengths of split polynomial maps modulo primes. (English)
Involve 15, No. 2, 185-206 (2022)

Summary: Explicit formulas are obtained for the number of periodic points and maximum tail length of split polynomial maps over finite fields for affine and projective space. This work includes a detailed analysis of the structure of the directed graph over finite fields for Chebyshev polynomials of nonprime degree in dimension 1 and the powering map in any dimension. The results are applied to provide an algorithm for determining the type of a given map defined over the rational numbers through analysis of its cycle statistics modulo primes.

MSC:
37P25 Dynamical systems over finite ground fields
37P35 Arithmetic properties of periodic points
11B50 Sequences (mod $m$)

Keywords:
functional graph; periodic points; Chebyshev polynomial; power map

Full Text: DOI