Wan, Daqing

On a problem of Niederreiter and Robinson about finite fields. (English) Zbl 0607.12009

J. Aust. Math. Soc., Ser. A 41, 336-338 (1986).

A polynomial f(x) over a finite field $\mathbb{F}_q$ is called a permutation polynomial of $\mathbb{F}_q$ if the mapping induced by f(x) is a permutation of $\mathbb{F}_q$. If both f(x) and $f(x) + x$ are permutation polynomials of $\mathbb{F}_q$, then f(x) is called a complete mapping polynomial of $\mathbb{F}_q$. The degree of the reduction of f(x) modulo $x^q - x$ is called the reduced degree of f(x).

The reviewer and *K. H. Robinson* [ibid. 33, 197-212 (1982; Zbl 0495.12018)] have shown that for a finite field $\mathbb{F}_q$ with odd order $q > 3$, any complete mapping polynomial has reduced degree at most q-3. In the present paper this result is proved for finite fields $\mathbb{F}_q$ of even order $q > 3$. The proof is based on a clever extension of the method for odd q.

Reviewer: H.Niederreiter

MSC:

11T06 Polynomials over finite fields

Keywords:

polynomial over finite field; permutation polynomial; complete mapping polynomial; reduced degree