


A new family of maximum scattered linear sets in $PG(1, q^6)^*$

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Abstract

We generalize the example of linear set presented by the last two authors in “Vertex properties of maximum scattered linear sets of $PG(1, q^n)$ ” (2019) to a more general family, proving that such linear sets are maximum scattered when q is odd and, apart from a special case, they are new. This solves an open problem posed in “Vertex properties of maximum scattered linear sets of $PG(1, q^n)$ ” (2019). As a consequence of Sheekey’s results in “A new family of linear maximum rank distance codes” (2016), this family yields to new MRD-codes with parameters $(6, 6, q; 5)$.

Keywords: Scattered linear set, MRD-code, linearized polynomial.

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Nova družina maksimalnih razpršenih linearnih množic v $PG(1, q^6)^*$

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Povzetek

Posplošimo primer linearne množice iz članka zadnjih dveh avtorjev “Vertex properties of maximum scattered linear sets of $PG(1, q^n)$ ” (2019) na splošnejšo družino, pri čemer dokažemo, da so takšne linearne množice maksimalno razpršene, kadar je q lih, in da so, razen v enem posebnem primeru, nove. S tem rešimo odprt problem iz članka “Vertex properties of maximum scattered linear sets of $PG(1, q^n)$ ” (2019). Upošteva je Sheekeyeve rezultate iz članka “Nova družina linearnih distančnih kod maksimalnega ranga” (2016), ta družina vodi k novim MRD-kodam s parametri $(6, 6, q; 5)$.

Ključne besede: Razpršena linearna množica, MRD-koda, linearizirani polinom.

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