

SEMINARIO DI GEOMETRIA E ALGEBRA

UNIBA - POLIBA

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Non-linear MRD codes from cones over exterior sets

Abstract. Let $\text{PG}(m, q^n)$ be an m -dimensional projective space over the finite field with q^n elements. Let A and B be two distinct points of $\text{PG}(m, q^n)$ and let Φ be a collineation, with accompanying field automorphism σ , between the stars (pencils if $m = 2$) of lines through A and B such that the line AB is not mapped into itself and the subspace spanned by the lines $AB, \Phi(AB), \Phi^{-1}(AB)$ has dimension $\min\{3, m\}$. The set \mathcal{X} consisting of points of intersection of corresponding lines under Φ is called σ -normal rational curve or C_F^σ -set.

A set of $n \times n$ matrices with entries in \mathbb{F}_q of size $q^{n(n-d+1)}$ is called *maximum rank distance code* or *MRD code* with parameters $(n, n, q; d)$ if the rank of the difference of any two of its elements is at least d .

In this talk, it will be outlined how starting from \mathcal{X} , it is possible to obtain a new family of non-linear $(n, n, q; d)$ -MRD codes for any $n \geq 3$, $2 \leq d \leq n - 1$ and $d = m$.



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