Tight sets on the Hermitian variety $H(2r + 1, q^2)$

(Talk)

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(joint work with Leo Storme (Ghent University))

A set $\mathcal{T}$ of points of a finite polar space $\mathcal{P}$ of rank $r \geq 2$ over a finite field of order $q$ is $i$-tight if for any $P \in \mathcal{P}$

$$|P^\perp \cap \mathcal{T}| = \begin{cases} i2^{r-1} - 1 + qr - 1, & P \in \mathcal{T} \\ i2^{r-1} - 1 q^{-1} + qr - 1, & P \notin \mathcal{T} \end{cases}$$

It has been shown in [1] that an $i$-tight set on the Hermitian variety $H(2r + 1, q^2)$, $q^2 > 16$, is a union of pairwise disjoint Baer subgeometries $PG(2r + 1, q)$ and generators $PG(r, q^2)$, when $i < q^{10/8}/\sqrt{2} + 1$. Combining the generalized version of known proving techniques [2], with recent results on blocking sets and minihypers, we have been able to give an alternative proof of this result and consequently improve the upper bound on $i$. We shed a new light on an "old" technique and show how it can be used to obtain new results.

References


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