The smallest minimal blocking sets of Q(6, q), q even

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Using results on the size of the smallest minimal blocking sets of Q(4, q), q even, of Eisfeld, Storme, Szőnyi and Sziklai [2], and results concerning the number of internal nuclei of (q+2)-sets in PG(2, q), q even, of Bichara and Korchmáros [1], together with projection arguments, we obtain the following characterization of the smallest minimal blocking sets of Q(6, q), q even and $q \ge 32$:

Theorem 1 Let \mathcal{K} be a minimal blocking set of Q(6,q), q even, $|\mathcal{K}| \leq q^3 + q$, $q \geq 32$. Then there is a point $p \in Q(6,q) \setminus \mathcal{K}$ with the following property: $T_p(Q(6,q)) \cap Q(6,q) = pQ(4,q)$ and \mathcal{K} consists of all the points of the lines L on p meeting Q(4,q) in an ovoid \mathcal{O} , minus the point p itself, and $|\mathcal{K}| = q^3 + q$.

- 1. A. Bichara and G. Korchmáros, Note on (q + 2)-sets in a Galois plane of order q, Combinatorial and geometric structures and their applications (Trento, 1980), pages 117–121. North-Holland, Amsterdam, 1982.
- J. Eisfeld, L. Storme, T. Szőnyi, and P. Sziklai, Covers and blocking sets of classical generalized quadrangles, Discrete Math., 238(1-3):35–51, 2001.