

Arcs and ovals in infinite K -clan geometry

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Abstract

For a finite field $\text{GF}(q)$, to a q -clan of matrices there are associated generalized quadrangles, flocks of quadratic cones in $\text{PG}(3, q)$, translation planes and, for q even, ovals in $\text{PG}(2, q)$. The connections with generalized quadrangles, flocks and translation planes have recently been extended to the case of an infinite field K , under certain extra assumptions. In this note we extend the theory of ovals in $\text{PG}(2, q)$ associated with q -clans, q even, to ovals in $\text{PG}(2, K)$ associated with K -clans for (infinite) fields K of characteristic 2. Again, certain extra assumptions on the field K are made.

1 Introduction

The term *q -clan geometry* is often used to refer to the well-developed theory of flocks of quadratic cones and their associated generalized quadrangles and translation planes, over a finite field $\text{GF}(q)$. In [4] F. De Clerck and H. Van Maldeghem used the coordinatization of a generalized quadrangle to extend this theory to the case of an infinite field K . They introduced a natural definition of a K -clan as a family of matrices and showed that there is an associated generalized quadrangle if and only if the associated flock is derivable.

Moving to the point of view of coset geometries and following the work of W.M. Kantor and S.E. Payne for finite fields, L. Bader and S.E. Payne [1] have further

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