PG(n,q) denotes the n-dimensional projective space over the field GF(q). A k-arc of points in it with \( k \geq n+1 \) is a set \( K \) of \( k \) points with the property that no \( n+1 \) points of \( K \) lie in a hyperplane. It may be noted that the study of k-arcs in PG(n,q) is interesting for coding theory also – the k-arcs of PG(n,q) and linear MDS codes of dimension \( n+1 \) and length over GF(q) are equivalent objects.

In this paper, the authors investigate the completeness of k-arcs in PG(n,q) where q is even. All the values of \( k \) are determined, for which there exists a complete k-arc in PG(n,q), \( q \geq 2 \geq n > q - \sqrt{q}/2 - 11/4 \). This is proved by using the duality principle between k-arcs in PG(n,q) and dual k-arcs in PG(k−n−2,q), \( (k \geq n+4) \). The theorems show that the classification of all complete k-arcs in PG(n,q), \( q \) even at \( q - 2 \geq n > q - \sqrt{q}/2 - 11/4 \) is closely related to the classification of all \((q+2)\)-arcs in PG(2,q).

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51E21 Blocking sets, ovals, k-arcs
51E22 Linear codes and caps in Galois spaces
94B05 Linear codes (general theory)

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