On the nucleus of the Grassmann-embedding of symplectic dual polar spaces in characteristic 2

Ilaria Cardinali
University of Siena

Let Δ be a dual polar space of rank n and let e be a full projective polarized embedding of Δ. We define the *nucleus* of e as the intersection of the subspaces spanned by the images of the singular hyperplanes of Δ. The quotient of e over its nucleus is again a full polarized embedding called the minimal full polarized embedding of Δ ([1]). We focus on the case in which Δ is a symplectic dual polar space $DW(2n-1, F)$ of rank n defined over a field F of even characteristic and e is the Grassmann-embedding of Δ.

We first consider $n = 3$ and $F = GF(2^r)$ and give a description of the nucleus of the Grassmann-embedding of $DW(5, 2^r)$ which allows us to obtain a geometrical description of the spin embedding of $DW(5, 2^r)$ showing how the natural embedding of $W(5, 2^r)$ is involved in the Grassmann-embedding of $DW(5, 2^r)$ ([2]).

Next, we will discuss some generalizations to the case of arbitrary rank n and arbitrary field of even characteristic and we construct a full projective embedding of the polar Grassmannian with respect to $(n-2)$-subspaces of $W(2n-1, F)$ into the nucleus of the Grassmann embedding of $DW(2n-1, F)$ ([3]).

References

[1] I. Cardinali, B. De Bruyn and A. Pasini. Minimal full polarized embeddings of dual polar spaces. *J. Algebraic Combin.* 25 (2007), 7–23.

[2] I. Cardinali and G. Lunardon. A geometric description of the spin-embedding of symplectic dual polar spaces of rank 3, *J. Combin. Theory Ser. A*, to appear.

[3] R. J. Blok, I. Cardinali and B. De Bruyn. On the nucleus of the Grassmann embedding of the symplectic dual polar space $DSp(2n, F), char(F) = 2$, in preparation.