The full automorphism group of a class of geometries constructed from classical polar spaces.

Stefaan De Winter

Recently Devillers and Van Maldeghem determined the full automorphism group of 4 geometries constructed from the classical finite parabolic polar space Q(6,q). One of these geometries is a semipartial geometry that was for the first time constructed by J.A. Thas. Thas's construction method however applies to non-degenerate parabolic quadrics $Q(2n,q)$, hyperbolic quadrics $Q^+(2n+1, q \in \{2,3\})$, Hermitian varieties $H(2n+1, q^2)$, provided the polar space admits a so-called SPG-system. In a first step we generalize one of the geometries defined for Q(6,q) by Devillers and Van Maldeghem (not the semipartial geometry) to all the above mentioned polar spaces. We show that its full automorphism group is the naturally expected one, namely the full automorphism group of the polar space on which the geometry is constructed. In a second step we prove that this geometry can be recovered in a unique way from a semipartial geometry constructed using Thas's method for the same polar space. This implies that the full automorphism group of the semipartial geometry must be a subgroup of the full automorphism group of the related polar space. This finally allows us to completely determine the full automorphism group of the considered semipartial geometry.