

Abstract

On α -points of q -analogs of the Fano plane

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Arguably, the most important open problem in the theory of q -analogs of designs is the question for the existence of a q -analog D of the Fano plane. It is undecided for every single prime power value $q \geq 2$.

A point P is called an α -point of D if the derived design of D in P is a geometric spread. In 1996, Simon Thomas has shown that there must always exist at least one non- α -point. For the binary case $q = 2$, Olof Heden and Papa Sissokho have improved this result in 2016 by showing that the non- α -points must form a blocking set with respect to the hyperplanes.

We will show that a hyperplane consisting only of α -points implies the existence of a partition of the symplectic generalized quadrangle $W(q)$ into spreads. As a consequence, the statement of Heden and Sissokho is generalized to all primes q and all even values of q .