

Dragan M. Acketa, Vojislav Mudrinski
A family of 4-designs on 26 points

Comment.Math.Univ.Carolinae 37,4 (1996) 843-860.

Abstract: Using the Kramer-Mesner method, 4-(26, 6, λ) designs with $PSL(2, 25)$ as a group of automorphisms and with λ in the set $\{30, 51, 60, 81, 90, 111\}$ are constructed. The search uses specific partitioning of columns of the orbit incidence matrix, related to so-called “quasi-designs”. Actions of groups $PSL(2, 25)$, $PGL(2, 25)$ and twisted $PGL(2, 25)$ are being compared. It is shown that there exist 4-(26, 6, λ) designs with $PGL(2, 25)$, respectively twisted $PGL(2, 25)$ as a group of automorphisms and with λ in the set $\{51, 60, 81, 90, 111\}$. With λ in the set $\{60, 81\}$, there exist designs which possess all three considered groups as groups of automorphisms. An overview of t -($q + 1, k, \lambda$) designs with $PSL(2, q)$ as group of automorphisms and with $(t, k) \in \{(4, 5), (4, 6), (5, 6)\}$ is included.

Keywords: block designs, orbits, projective linear group, projective special linear group, twisted projective linear group, Kramer-Mesner method

AMS Subject Classification: 05B30