1 BLT set 5 over GF(29)

Points on the quadric $x_0^2 + x_1x_2 + x_3x_4$:

$P_1 = (0, 1, 0, 0, 0)$

$P_2 = (0, 0, 1, 0, 0)$

$P_3 = (0, 1, 14, 28, 14)$

$P_4 = (0, 1, 18, 14, 7)$

$P_5 = (0, 1, 2, 24, 12)$

$P_6 = (0, 1, 19, 22, 11)$

$P_7 = (0, 1, 11, 12, 16)$

$P_8 = (0, 1, 11, 3, 6)$

$P_9 = (0, 1, 12, 17, 1)$

$P_{10} = (0, 1, 12, 2, 23)$

$P_{11} = (1, 18, 4, 24, 3)$

$P_{12} = (1, 10, 28, 14, 11)$

$P_{13} = (1, 12, 25, 8, 24)$

$P_{14} = (1, 18, 4, 6, 12)$

$P_{15} = (1, 26, 1, 26, 9)$

$P_{16} = (1, 26, 1, 18, 13)$

$P_{17} = (1, 12, 25, 19, 4)$

$P_{18} = (1, 10, 28, 22, 7)$

$P_{19} = (1, 17, 7, 19, 12)$

$P_{20} = (1, 17, 7, 24, 24)$

$P_{21} = (1, 11, 22, 20, 27)$

$P_{22} = (1, 11, 22, 25, 10)$

$P_{23} = (1, 12, 25, 18, 1)$

$P_{24} = (1, 3, 4, 5, 9)$

$P_{25} = (1, 12, 25, 2, 9)$

$P_{26} = (1, 3, 4, 18, 17)$

$P_{27} = (1, 4, 10, 18, 9)$

$P_{28} = (1, 4, 19, 7, 18)$

$P_{29} = (1, 24, 27, 23, 26)$

$P_{30} = (1, 13, 2, 2, 1)$

Stabilizer of order 48 is generated by:

$$g_1 = \begin{pmatrix} 28 & 0 & 0 & 0 & 0 \\ 0 & 6 & 26 & 23 & 26 \\ 0 & 3 & 6 & 14 & 7 \\ 0 & 7 & 26 & 23 & 11 \\ 0 & 14 & 23 & 15 & 23 \end{pmatrix}$$

$$g_2 = \begin{pmatrix} 28 & 0 & 0 & 0 & 0 \\ 0 & 28 & 0 & 0 & 0 \\ 0 & 0 & 28 & 0 & 0 \\ 0 & 0 & 0 & 0 & 14 \\ 0 & 0 & 0 & 27 & 0 \end{pmatrix}$$

$$g_3 = \begin{pmatrix} 28 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 21 & 1 & 4 & 2 \\ 0 & 2 & 0 & 0 & 14 \\ 0 & 4 & 0 & 27 & 0 \end{pmatrix}$$

$$g_4 = \begin{pmatrix} 7 & 15 & 0 & 7 & 18 \\ 0 & 12 & 0 & 0 & 0 \\ 22 & 1 & 17 & 19 & 24 \\ 9 & 19 & 0 & 26 & 27 \\ 18 & 9 & 0 & 21 & 26 \end{pmatrix}$$

$$g_5 = \begin{pmatrix} 15 & 21 & 0 & 4 & 2 \\ 0 & 28 & 18 & 17 & 13 \\ 4 & 14 & 16 & 24 & 19 \\ 28 & 18 & 20 & 14 & 26 \\ 27 & 16 & 3 & 12 & 15 \end{pmatrix}$$

Induced action on the BLT-set:

The induced group has order 48 and is generated by:

g_1 =(1, 3)(2, 5)(4, 6)(7, 8)(11, 14)(12, 18)(13, 17)(15, 16)(19, 22)(20, 21)(23, 26)(24, 25)(27, 30)(28, 29)

g_2 =(7, 8)(9, 10)(11, 14)(12, 18)(13, 17)(15, 16)(19, 20)(21, 22)(23, 25)(24, 26)

g_3 =(2, 4)(5, 6)(11, 17)(12, 15)(13, 14)(16, 18)(19, 22)(20, 21)(23, 26)(24, 25)(27, 28)(29, 30)

g_4 =(2, 27, 4, 28)(5, 29, 6, 30)(7, 9, 8, 10)(11, 26, 13, 25)(12, 21, 16, 19)(14, 24, 17, 23)(15, 20, 18, 22)

g_5 =(1, 7, 10)(2, 14, 22)(3, 8, 9)(4, 13, 19)(5, 17, 21)(6, 11, 20)(12, 23, 27)(15, 26, 28)(16, 25, 30)(18, 24, 29)

Kernel has order 1 and is generated by:

There are 2 orbits on the BLT set.

The orbit length are $[24, 6]$

The orbits are:

$O_0 = \{1, 3, 7, 8, 9, 10\}$ (length 6)

$O_1 = \{2, 4, 5, 6, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30\}$ (length 24)

The actions induced on the orbits are:

Induced action on orbit $O_0 = \{1, 3, 7, 8, 9, 10\}$ (length 6)

The induced group has order 24 and is generated by:

g_1 =(1, 2)(3, 4)

g_2 =(3, 4)(5, 6)

g_3 =id

g_4 =(3, 5, 4, 6)

g_5 =(1, 3, 6)(2, 4, 5)

Kernel has order 2 and is generated by:

$$b_1 = \begin{pmatrix} 28 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 21 & 1 & 4 & 2 \\ 0 & 2 & 0 & 0 & 14 \\ 0 & 4 & 0 & 27 & 0 \end{pmatrix}$$

$$b_2 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

The kernel has 12645 orbits on the quadric.

The orbit length are $[2^{12615}, 1^{30}]$

Induced action on orbit $O_1 = \{2, 146\}$ (length 2)

The induced group has order 2 and is generated by:

g_1 =(1, 2)

g_2 =id

Kernel has order 1 and is generated by:

Induced action on orbit $O_1 = \{2, 4, 5, 6, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30\}$ (length 24)

The induced group has order 48 and is generated by:

g_1 =(1, 3)(2, 4)(5, 8)(6, 12)(7, 11)(9, 10)(13, 16)(14, 15)(17, 20)(18, 19)(21, 24)(22, 23)

$g_2 =$(5, 8)(6, 12)(7, 11)(9, 10)(13, 14)(15, 16)(17, 19)(18, 20)

$g_3 =$(1, 2)(3, 4)(5, 11)(6, 9)(7, 8)(10, 12)(13, 16)(14, 15)(17, 20)(18, 19)(21, 22)(23, 24)

$g_4 =$(1, 21, 2, 22)(3, 23, 4, 24)(5, 20, 7, 19)(6, 15, 10, 13)(8, 18, 11, 17)(9, 14, 12, 16)

$g_5 =$(1, 8, 16)(2, 7, 13)(3, 11, 15)(4, 5, 14)(6, 17, 21)(9, 20, 22)(10, 19, 24)(12, 18, 23)

Kernel has order 1 and is generated by: