

1 BLT set 6 over GF(23)

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

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

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

$$P_3 = (0, 1, 9, 22, 9)$$

$$P_4 = (0, 1, 8, 11, 16)$$

$$P_5 = (0, 1, 12, 13, 15)$$

$$P_6 = (0, 1, 8, 9, 17)$$

$$P_7 = (1, 22, 20, 19, 1)$$

$$P_8 = (1, 17, 7, 18, 1)$$

$$P_9 = (1, 10, 21, 10, 18)$$

$$P_{10} = (1, 13, 12, 19, 22)$$

$$P_{11} = (1, 17, 15, 2, 10)$$

$$P_{12} = (1, 16, 9, 3, 13)$$

$$P_{13} = (1, 10, 21, 9, 20)$$

$$P_{14} = (1, 13, 1, 20, 20)$$

$$P_{15} = (1, 7, 19, 15, 11)$$

$$P_{16} = (1, 16, 9, 2, 8)$$

$$P_{17} = (1, 2, 16, 16, 8)$$

$$P_{18} = (1, 7, 21, 18, 2)$$

$$P_{19} = (1, 1, 3, 18, 10)$$

$$P_{20} = (1, 21, 14, 18, 13)$$

$$P_{21} = (1, 16, 1, 22, 17)$$

$$P_{22} = (1, 6, 8, 19, 18)$$

$$P_{23} = (1, 6, 1, 12, 9)$$

$$P_{24} = (1, 7, 17, 19, 7)$$

Stabilizer of order 44 is generated by:

$$g_1 = \begin{pmatrix} 22 & 0 & 0 & 0 & 0 \\ 0 & 1 & 9 & 22 & 9 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 9 & 22 & 0 \\ 0 & 0 & 22 & 0 & 22 \end{pmatrix}$$

$$g_2 = \begin{pmatrix} 14 & 0 & 0 & 20 & 19 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 3 & 1 & 10 & 2 \\ 21 & 2 & 0 & 4 & 22 \\ 10 & 10 & 0 & 21 & 4 \end{pmatrix}$$

$$g_3 = \begin{pmatrix} 14 & 0 & 18 & 15 & 10 \\ 9 & 15 & 17 & 1 & 9 \\ 0 & 22 & 15 & 12 & 7 \\ 5 & 7 & 9 & 12 & 8 \\ 19 & 12 & 1 & 13 & 12 \end{pmatrix}$$

Induced action on the BLT-set:

The induced group has order 44 and is generated by:

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

$$g_2 = (2, 4)(5, 12)(6, 24)(7, 11)(8, 16)(9, 20)(10, 21)(13, 15)(14, 17)(18, 23)(19, 22)$$

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

Kernel has order 1 and is generated by:

There are 2 orbits on the BLT set.

The orbit length are [22, 2]

The orbits are:

$$O_0 = \{1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24\} \text{ (length 22)}$$

$$O_1 = \{2, 4\} \text{ (length 2)}$$

The actions induced on the orbits are:

Induced action on orbit $O_0 = \{1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24\}$
(length 22)

The induced group has order 44 and is generated by:

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

$$g_2 = (3, 10)(4, 22)(5, 9)(6, 14)(7, 18)(8, 19)(11, 13)(12, 15)(16, 21)(17, 20)$$

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

Kernel has order 1 and is generated by:

Induced action on orbit $O_1 = \{2, 4\}$ (length 2)

The induced group has order 2 and is generated by:

$$g_1 = \text{id}$$

$$g_2 = (1, 2)$$

$$g_3 = (1, 2)$$

Kernel has order 22 and is generated by:

$$b_1 = \begin{pmatrix} 17 & 0 & 18 & 13 & 15 \\ 6 & 9 & 6 & 5 & 5 \\ 0 & 0 & 18 & 0 & 0 \\ 3 & 0 & 3 & 1 & 14 \\ 22 & 0 & 6 & 21 & 12 \end{pmatrix}$$

$$b_2 = \begin{pmatrix} 22 & 0 & 0 & 0 & 0 \\ 0 & 22 & 0 & 0 & 0 \\ 0 & 0 & 22 & 0 & 0 \\ 0 & 0 & 0 & 22 & 0 \\ 0 & 0 & 0 & 0 & 22 \end{pmatrix}$$

$$b_3 = \begin{pmatrix} 6 & 0 & 5 & 10 & 8 \\ 17 & 9 & 12 & 9 & 7 \\ 0 & 0 & 18 & 0 & 0 \\ 20 & 0 & 21 & 22 & 9 \\ 1 & 0 & 22 & 2 & 11 \end{pmatrix}$$

The kernel has 583 orbits on the quadric.

The orbit length are $[22^{577}, 11^2, 1^4]$

Induced action on orbit $O_{29} = \{32, 1649, 1685, 1861, 1907, 2008, 2053, 2239, 2285, 2401, 2552\}$
(length 11)

The induced group has order 11 and is generated by:

$$g_1 = (1, 8, 2, 6, 10, 7, 4, 11, 5, 9, 3)$$

$$g_2 = \text{id}$$

$$g_3 = (1, 8, 2, 6, 10, 7, 4, 11, 5, 9, 3)$$

Kernel has order 2 and is generated by:

$$b_1 = \begin{pmatrix} 22 & 0 & 0 & 0 & 0 \\ 0 & 1 & 9 & 22 & 9 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 9 & 22 & 0 \\ 0 & 0 & 22 & 0 & 22 \end{pmatrix}$$

The kernel has 6373 orbits on the quadric.

The orbit length are $[2^{6347}, 1^{26}]$

Induced action on orbit $O_0 = \{1, 181\}$ (length 2)

The induced group has order 2 and is generated by:

$$g_1 = (1, 2)$$

Kernel has order 1 and is generated by:

