1 BLT set 2 over GF(9)

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

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

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

$P_3 = (0, 1, 7, 2, 7)$

$P_4 = (0, 1, 7, 1, 5)$

$P_5 = (0, 1, 5, 6, 8)$

$P_6 = (0, 1, 5, 5, 2)$

$P_7 = (0, 1, 5, 3, 4)$

$P_8 = (0, 1, 7, 8, 3)$

$P_9 = (0, 1, 7, 4, 6)$

$P_{10} = (0, 1, 5, 7, 1)$

Stabilizer of order 5760 is generated by:

$$g_1 = \begin{pmatrix} 2 & 0 & 0 & 0 & 0 \\ 0 & 6 & 0 & 0 & 0 \\ 0 & 0 & 7 & 0 & 0 \\ 0 & 0 & 0 & 0 & 4 \\ 0 & 0 & 0 & 8 & 0 \end{pmatrix}, 1$$

$$g_2 = \begin{pmatrix} 2 & 0 & 0 & 0 & 0 \\ 0 & 3 & 4 & 6 & 4 \\ 0 & 0 & 5 & 0 & 0 \\ 0 & 0 & 4 & 6 & 0 \\ 0 & 0 & 7 & 0 & 7 \end{pmatrix}, 1$$

$$g_3 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 0 & 0 & 0 & 2 & 0 \\ 0 & 0 & 0 & 0 & 2 \end{pmatrix}, 0$$

$$g_4 = \begin{pmatrix} 2 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 6 & 1 & 6 & 2 \\ 0 & 2 & 0 & 0 & 7 \\ 0 & 6 & 0 & 6 & 0 \end{pmatrix}, 0$$

$$g_5 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 3 & 4 & 3 & 8 \\ 0 & 8 & 0 & 0 & 0 \\ 0 & 3 & 0 & 3 & 0 \\ 0 & 4 & 0 & 0 & 5 \end{pmatrix}, 1$$

$$g_6 = \begin{pmatrix} 2 & 0 & 0 & 0 & 0 \\ 0 & 3 & 0 & 0 & 0 \\ 0 & 0 & 5 & 0 & 0 \\ 0 & 0 & 0 & 3 & 0 \\ 0 & 0 & 0 & 0 & 5 \end{pmatrix}, 1$$

$$g_7 = \begin{pmatrix} 2 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 2 & 0 \\ 0 & 0 & 0 & 0 & 2 \end{pmatrix}, 0$$

$$g_8 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 3 & 0 & 0 & 0 \\ 0 & 4 & 5 & 3 & 2 \\ 0 & 1 & 0 & 5 & 0 \\ 0 & 5 & 0 & 0 & 3 \end{pmatrix}, 1$$

$$g_9 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 3 & 0 & 0 & 0 \\ 0 & 0 & 5 & 0 & 0 \\ 0 & 0 & 0 & 5 & 0 \\ 0 & 0 & 0 & 0 & 3 \end{pmatrix}, 1$$

$$g_{10} = \begin{pmatrix} 2 & 0 & 0 & 0 & 0 \\ 0 & 5 & 0 & 0 & 0 \\ 0 & 0 & 3 & 0 & 0 \\ 0 & 0 & 0 & 4 & 0 \\ 0 & 0 & 0 & 0 & 8 \end{pmatrix}, 1$$

Induced action on the BLT-set:

The induced group has order 1440 and is generated by:

g_1 =id

g_2 =(1, 3)(7, 9)(8, 10)

g_3 =id

g_4 =(2, 4)(7, 8)(9, 10)

g_5 =(1, 4, 3, 2)(7, 8, 10, 9)

g_6 =(5, 6)(7, 10)(8, 9)

g_7 =(3, 4)(5, 7)(6, 10)(8, 9)

g_8 =(2, 5)(4, 6)(8, 10)

g_9 =(3, 8)(4, 9)(5, 7)

g_{10} =(3, 5, 4, 7)(6, 8, 10, 9)

Kernel has order 4 and is generated by:

$$b_1 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 0 & 0 & 0 & 2 & 0 \\ 0 & 0 & 0 & 0 & 2 \end{pmatrix}, 0$$

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

$$b_3 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 3 & 0 & 0 & 0 \\ 0 & 0 & 5 & 0 & 0 \\ 0 & 0 & 0 & 0 & 8 \\ 0 & 0 & 0 & 4 & 0 \end{pmatrix}, 1$$

$$b_4 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}, 0$$

The kernel has 235 orbits on the quadric.

The orbit length are $[4^{180}, 2^{45}, 1^{10}]$

Induced action on orbit $O_2 = \{3, 20\}$ (length 2)

The induced group has order 2 and is generated by:

g_1 =id

g_2 =id

g_3 =(1, 2)

g_4 =id

Kernel has order 2 and is generated by:

$$b_1 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 0 & 0 & 0 & 2 & 0 \\ 0 & 0 & 0 & 0 & 2 \end{pmatrix}, 0$$

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

The kernel has 460 orbits on the quadric.

The orbit length are $[2^{360}, 1^{100}]$

Induced action on orbit $O_{100} = \{101, 102\}$ (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:

There are 1 orbits on the BLT set.

The orbit length are [10]

The orbits are:

$O_0 = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ (length 10)