1 BLT set 1 over GF(7)

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

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

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

$P_3 = (0, 1, 2, 6, 2)$

$P_4 = (0, 1, 4, 3, 1)$

$P_5 = (0, 1, 1, 2, 3)$

$P_6 = (0, 1, 1, 5, 4)$

$P_7 = (0, 1, 2, 1, 5)$

$P_8 = (0, 1, 4, 4, 6)$

Stabilizer of order 5376 is generated by:

$$g_1 = \begin{pmatrix} 2 & 0 & 0 & 3 & 6 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 3 & 0 & 0 & 3 & 4 \\ 5 & 0 & 0 & 1 & 3 \end{pmatrix}$$

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

$$g_3 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 6 & 0 & 0 & 0 \\ 0 & 6 & 6 & 5 & 4 \\ 0 & 4 & 0 & 0 & 5 \\ 0 & 5 & 0 & 3 & 0 \end{pmatrix}$$

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

$$g_5 = \begin{pmatrix} 2 & 0 & 0 & 4 & 1 \\ 0 & 1 & 1 & 2 & 3 \\ 0 & 1 & 0 & 0 & 0 \\ 3 & 3 & 0 & 4 & 3 \\ 5 & 2 & 0 & 6 & 4 \end{pmatrix}$$

$$g_6 = \begin{pmatrix} 6 & 0 & 0 & 0 & 0 \\ 0 & 5 & 6 & 1 & 5 \\ 0 & 6 & 5 & 1 & 5 \\ 0 & 5 & 5 & 2 & 5 \\ 0 & 1 & 1 & 3 & 2 \end{pmatrix}$$

$$g_7 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 4 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

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

Induced action on the BLT-set:

The induced group has order 336 and is generated by:

g_1 =id

$g_2 =$id

$g_3 =(2,\ 5)(3,\ 4)(6,\ 7)$

$g_4 =$id

$g_5 =(1,\ 5,\ 2)(6,\ 7,\ 8)$

$g_6 =(1,\ 4)(2,\ 3)(5,\ 6)$

$g_7 =(3,\ 4,\ 6)(5,\ 7,\ 8)$

$g_8 =(3,\ 8,\ 6,\ 7,\ 4,\ 5)$

Kernel has order 16 and is generated by:

$$b_1 = \begin{pmatrix} 0 & 0 & 0 & 5 & 3 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 5 & 0 & 0 & 4 & 6 \\ 6 & 0 & 0 & 5 & 4 \end{pmatrix}$$

$$b_2 = \begin{pmatrix} 6 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$b_3 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

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

$$b_5 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$b_6 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$b_7 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$b_8 = \begin{pmatrix} 5 & 0 & 0 & 4 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 4 & 0 & 0 & 5 & 1 \\ 2 & 0 & 0 & 2 & 5 \end{pmatrix}$$

The kernel has 57 orbits on the quadric.

The orbit length are $[8^{49}, 1^8]$

Induced action on orbit $O_2 = \{3, 16, 143, 156, 169, 182, 195, 208\}$ (length 8)

The induced group has order 16 and is generated by:

g_1 =(1, 4)(2, 7)(6, 8)

g_2 =(3, 8)(4, 7)(5, 6)

g_3 =id

g_4 =id

g_5 =id

g_6 =id

g_7 =id

g_8 =(1, 6)(2, 8)(3, 4)(5, 7)

Kernel has order 1 and is generated by:

There are 1 orbits on the BLT set.

The orbit length are [8]

The orbits are:

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