# 1 BLT set 2 over GF(43)

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

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

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

$P_3 = (0, 1, 21, 42, 21)$

$P_4 = (0, 1, 16, 21, 32)$

$P_5 = (0, 1, 31, 14, 7)$

$P_6 = (0, 1, 4, 32, 16)$

$P_7 = (0, 1, 38, 15, 29)$

$P_8 = (0, 1, 14, 31, 37)$

$P_9 = (0, 1, 25, 6, 3)$

$P_{10} = (0, 1, 41, 2, 1)$

$P_{11} = (0, 1, 25, 37, 40)$

$P_{12} = (0, 1, 13, 19, 31)$

$P_{13} = (0, 1, 17, 3, 23)$

$P_{14} = (0, 1, 41, 41, 42)$

$P_{15} = (0, 1, 10, 25, 34)$

$P_{16} = (0, 1, 9, 5, 24)$

$P_{17} = (0, 1, 24, 9, 26)$

$P_{18} = (0, 1, 15, 23, 33)$

$P_{19} = (0, 1, 17, 40, 20)$

$P_{20} = (0, 1, 35, 4, 2)$

$P_{21} = (0, 1, 1, 27, 35)$

$P_{22} = (0, 1, 21, 1, 22)$

$P_{23} = (1, 17, 35, 6, 1)$

$P_{24} = (1, 14, 1, 5, 40)$

$P_{25} = (1, 21, 23, 16, 2)$

$P_{26} = (1, 24, 14, 4, 34)$

$P_{27} = (1, 19, 29, 18, 41)$

$P_{28} = (1, 22, 20, 39, 35)$

$P_{29} = (1, 29, 42, 6, 19)$

$P_{30} = (1, 26, 8, 41, 40)$

$P_{31} = (1, 16, 38, 41, 25)$

$P_{32} = (1, 34, 27, 23, 18)$

$P_{33} = (1, 7, 22, 31, 38)$

$P_{34} = (1, 13, 4, 12, 35)$

$P_{35} = (1, 1, 40, 20, 13)$

$P_{36} = (1, 12, 7, 10, 13)$

$P_{37} = (1, 33, 30, 38, 9)$

$P_{38} = (1, 10, 13, 25, 24)$

$P_{39} = (1, 31, 36, 17, 38)$

$P_{40} = (1, 42, 3, 17, 33)$

$P_{41} = (1, 30, 39, 16, 37)$

$P_{42} = (1, 36, 21, 10, 6)$

$P_{43} = (1, 9, 16, 7, 10)$

$P_{44} = (1, 27, 5, 36, 1)$

Stabilizer of order 3872 is generated by:

$$g_1 = \begin{pmatrix} 40 & 0 & 0 & 4 & 41 \\ 0 & 2 & 32 & 42 & 21 \\ 0 & 7 & 2 & 12 & 6 \\ 42 & 6 & 21 & 42 & 41 \\ 2 & 12 & 42 & 35 & 42 \end{pmatrix}$$

$$g_2 = \begin{pmatrix} 17 & 0 & 0 & 19 & 12 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 37 & 0 & 0 & 9 & 39 \\ 12 & 0 & 0 & 27 & 9 \end{pmatrix}$$

$$g_3 = \begin{pmatrix} 0 & 0 & 0 & 16 & 35 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 39 & 0 & 0 & 22 & 11 \\ 8 & 0 & 0 & 1 & 22 \end{pmatrix}$$

$$g_4 = \begin{pmatrix} 35 & 0 & 0 & 13 & 15 \\ 0 & 20 & 3 & 40 & 20 \\ 0 & 29 & 0 & 0 & 0 \\ 29 & 22 & 0 & 26 & 9 \\ 28 & 1 & 0 & 36 & 26 \end{pmatrix}$$

$$g_5 = \begin{pmatrix} 40 & 0 & 0 & 4 & 41 \\ 0 & 42 & 0 & 0 & 0 \\ 0 & 22 & 42 & 1 & 22 \\ 42 & 22 & 0 & 2 & 21 \\ 2 & 1 & 0 & 41 & 2 \end{pmatrix}$$

$$g_6 = \begin{pmatrix} 0 & 33 & 42 & 38 & 19 \\ 21 & 25 & 11 & 38 & 40 \\ 38 & 6 & 25 & 10 & 4 \\ 31 & 4 & 40 & 39 & 33 \\ 19 & 10 & 38 & 24 & 39 \end{pmatrix}$$

The induced group has order 3872 and is generated by:

$g_1$ =(1, 4)(2, 5)(3, 6)(7, 10)(9, 11)(12, 13)(14, 20)(15, 17)(16, 22)(18, 21)(23, 44)(24, 35)(25, 38)(26, 34)(27, 41)(28, 37)(29, 40)(30, 31)(32, 39)(36, 43)

$g_2$ =(23, 31, 27, 29, 39, 37, 42, 28, 32, 40, 41, 30, 44, 26, 24, 36, 38, 33, 25, 43, 35, 34)

$g_3$ =(23, 33)(24, 29)(25, 34)(26, 39)(27, 36)(28, 41)(30, 42)(31, 38)(32, 40)(35, 43)(37, 44)

$g_4$ =(1, 10, 9, 14, 21, 6, 15, 8, 17, 3, 18, 20, 11, 7, 4, 5, 12, 16, 19, 22, 13, 2)(23, 43)(24, 37)(25, 31)(26, 42)(27, 33)(28, 44)(29, 38)(30, 32)(34, 35)(36, 39)(40, 41)

$g_5$ =(2, 10)(3, 7)(4, 17)(5, 8)(6, 16)(9, 13)(11, 18)(12, 15)(14, 22)(19, 21)(23, 44)(24, 35)(25, 38)(26, 34)(27, 41)(28, 37)(29, 40)(30, 31)(32, 39)(36, 43)

$g_6$ =(1, 42)(2, 31)(3, 28)(4, 41)(5, 36)(6, 40)(7, 37)(8, 43)(9, 38)(10, 30)(11, 23)(12, 35)(13, 25)(14, 34)(15, 24)(16, 29)(17, 27)(18, 44)(19, 32)(20, 33)(21, 39)(22, 26)

Kernel has order 1 and is generated by:

There are 1 orbits on the BLT set.

The orbit length are [44]

The orbits are:

$O_0 = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34,$

(length 44)