Rank-65904 over GF(8)

January 15, 2021

The equation

The equation of the surface is :

$$X_0^3 + X_2^3 + X_3^3 + X_0^2 X_2 + X_0^2 X_3 + X_1^2 X_2 + X_0 X_1 X_2 = 0$$

(1, 0, 1, 1, 0, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(8) is 1244206222

General information

Number of lines	15
Number of points	105
Number of singular points	0
Number of Eckardt points	1
Number of double points	42
Number of single points	48
Number of points off lines	14
Number of Hesse planes	0
Number of axes	0
Type of points on lines	9^{15}
Type of lines on points	$3, 2^{42}, 1^{48}, 0^{14}$

Singular Points

The surface has 0 singular points:

The 15 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & \gamma^6 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{3504} = \begin{bmatrix} 1 & 0 & 0 & 6 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{3504} = \mathbf{Pl}(2,0,0,1,0,0)_{19}$$

$$\ell_1 = \begin{bmatrix} 1 & 0 & 0 & \gamma^5 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{1752} = \begin{bmatrix} 1 & 0 & 0 & 3 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{1752} = \mathbf{Pl}(4,0,0,1,0,0)_{21}$$

$$\ell_2 = \begin{bmatrix} 1 & 0 & 0 & \gamma^3 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{2920} = \begin{bmatrix} 1 & 0 & 0 & 5 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{2920} = \mathbf{Pl}(7,0,0,1,0,0)_{24}$$

$$\ell_3 = \begin{bmatrix} 1 & 0 & \gamma^6 & 0 \\ 0 & 1 & \gamma^3 & 1 \end{bmatrix}_{451} = \begin{bmatrix} 1 & 0 & 6 & 0 \\ 0 & 1 & 5 & 1 \end{bmatrix}_{451} = \mathbf{Pl}(1,1,5,0,2,1)_{1756}$$

$$\ell_4 = \begin{bmatrix} 1 & 0 & \gamma^6 & 0 \\ 0 & 1 & \gamma^4 & \gamma^3 \end{bmatrix}_{485} = \begin{bmatrix} 1 & 0 & 6 & 0 \\ 0 & 1 & 7 & 5 \end{bmatrix}_{485} = \mathbf{Pl}(7,5,2,0,7,1)_{4261}$$

$$\ell_5 = \begin{bmatrix} 1 & 0 & \gamma^5 & 0 \\ 0 & 1 & \gamma^6 & 1 \end{bmatrix}_{233} = \begin{bmatrix} 1 & 0 & 3 & 0 \\ 0 & 1 & 6 & 1 \end{bmatrix}_{233} = \mathbf{Pl}(1,1,6,0,4,1)_{2771}$$

$$\ell_6 = \begin{bmatrix} 1 & 0 & \gamma^5 & 0 \\ 0 & 1 & \gamma & \gamma^6 \end{bmatrix}_{269} = \begin{bmatrix} 1 & 0 & 3 & 0 \\ 0 & 1 & 2 & 6 \end{bmatrix}_{269} = \mathbf{Pl}(2,6,4,0,2,1)_{1750}$$

$$\ell_7 = \begin{bmatrix} 1 & 0 & \gamma^3 & 0 \\ 0 & 1 & \gamma^5 & 1 \end{bmatrix}_{376} = \begin{bmatrix} 1 & 0 & 5 & 0 \\ 0 & 1 & 3 & 1 \end{bmatrix}_{376} = \mathbf{Pl}(1,1,3,0,7,1)_{4262}$$

$$\ell_8 = \begin{bmatrix} 1 & 0 & \gamma^3 & 0 \\ 0 & 1 & \gamma^2 & \gamma^5 \end{bmatrix}_{393} = \begin{bmatrix} 1 & 0 & 5 & 0 \\ 0 & 1 & 4 & 3 \end{bmatrix}_{393} = \mathbf{Pl}(4,3,7,0,4,1)_{2781}$$

$$\ell_9 = \begin{bmatrix} 1 & 0 & 1 & \gamma^3 \\ 0 & 1 & \gamma^4 & \gamma^3 \end{bmatrix}_{3040} = \begin{bmatrix} 1 & 0 & 1 & 5 \\ 0 & 1 & 7 & 5 \end{bmatrix}_{3040} = \mathbf{Pl}(3,4,7,5,5,1)_{3732}$$

$$\ell_{10} = \begin{bmatrix} 1 & 0 & \gamma^5 & 1 \\ 0 & 1 & \gamma^3 & 1 \end{bmatrix}_{816} = \begin{bmatrix} 1 & 0 & 3 & 1 \\ 0 & 1 & 5 & 1 \end{bmatrix}_{816} = \mathbf{Pl}(6,2,3,4,4,1)_{3035}$$

$$\ell_{11} = \begin{bmatrix} 1 & 0 & \gamma^3 & 1 \\ 0 & 1 & \gamma^6 & 1 \end{bmatrix}_{963} = \begin{bmatrix} 1 & 0 & 5 & 1 \\ 0 & 1 & 6 & 1 \end{bmatrix}_{963} = \mathbf{Pl}(3,4,5,7,7,1)_{4642}$$

$$\ell_{12} = \begin{bmatrix} 1 & 0 & 1 & \gamma^6 \\ 0 & 1 & \gamma & \gamma^6 \end{bmatrix}_{3627} = \begin{bmatrix} 1 & 0 & 1 & 6 \\ 0 & 1 & 2 & 6 \end{bmatrix}_{3627} = \mathbf{Pl}(5,7,2,6,6,1)_{3993}$$

$$\ell_{13} = \begin{bmatrix} 1 & 0 & \gamma^6 & 1 \\ 0 & 1 & \gamma^5 & 1 \end{bmatrix}_{1033} = \begin{bmatrix} 1 & 0 & 6 & 1 \\ 0 & 1 & 3 & 1 \end{bmatrix}_{1033} = \mathbf{Pl}(5,7,6,2,2,1)_{2173}$$

$$\ell_{14} = \begin{bmatrix} 1 & 0 & 1 & \gamma^5 \\ 0 & 1 & \gamma^2 & \gamma^5 \end{bmatrix}_{1853} = \begin{bmatrix} 1 & 0 & 1 & 3 \\ 0 & 1 & 4 & 3 \end{bmatrix}_{1853} = \mathbf{Pl}(6,2,4,3,3,1)_{2580}$$

Rank of lines: (3504, 1752, 2920, 451, 485, 233, 269, 376, 393, 3040, 816, 963, 3627, 1033, 1853)
Rank of points on Klein quadric: (19, 21, 24, 1756, 4261, 2771, 1750, 4262, 2781, 3732, 3035, 4642, 3993, 2173, 2580)

Eckardt Points

The surface has 1 Eckardt points:
$0 : P_1 = \mathbf{P}(0,1,0,0) = \mathbf{P}(0,1,0,0)$.

Double Points

The surface has 42 Double points:
The double points on the surface are:

$P_{84} = (2,1,0,1) = \ell_0 \cap \ell_5$ $P_{134} = (4,7,0,1) = \ell_1 \cap \ell_4$
$P_{108} = (2,4,0,1) = \ell_0 \cap \ell_8$ $P_{86} = (4,1,0,1) = \ell_1 \cap \ell_7$
$P_{100} = (2,3,0,1) = \ell_0 \cap \ell_{11}$ $P_{102} = (4,3,0,1) = \ell_1 \cap \ell_9$
$P_{124} = (2,6,0,1) = \ell_0 \cap \ell_{14}$ $P_{118} = (4,5,0,1) = \ell_1 \cap \ell_{13}$

$P_{89} = (7,1,0,1) = \ell_2 \cap \ell_3$
$P_{97} = (7,2,0,1) = \ell_2 \cap \ell_6$
$P_{129} = (7,6,0,1) = \ell_2 \cap \ell_{10}$
$P_{121} = (7,5,0,1) = \ell_2 \cap \ell_{12}$
$P_{13} = (2,0,1,0) = \ell_3 \cap \ell_4$
$P_{533} = (4,1,7,1) = \ell_3 \cap \ell_5$
$P_{339} = (2,1,4,1) = \ell_3 \cap \ell_7$
$P_{401} = (0,1,5,1) = \ell_3 \cap \ell_{10}$
$P_{150} = (5,1,1,1) = \ell_3 \cap \ell_{14}$
$P_{257} = (0,7,2,1) = \ell_4 \cap \ell_9$
$P_{199} = (6,7,1,1) = \ell_4 \cap \ell_{11}$
$P_{518} = (5,7,6,1) = \ell_4 \cap \ell_{12}$
$P_{452} = (3,7,5,1) = \ell_4 \cap \ell_{14}$
$P_{15} = (4,0,1,0) = \ell_5 \cap \ell_6$
$P_{216} = (7,1,2,1) = \ell_5 \cap \ell_7$
$P_{151} = (6,1,1,1) = \ell_5 \cap \ell_9$
$P_{465} = (0,1,6,1) = \ell_5 \cap \ell_{11}$
$P_{478} = (5,2,6,1) = \ell_6 \cap \ell_9$

$P_{345} = (0,2,4,1) = \ell_6 \cap \ell_{12}$
$P_{156} = (3,2,1,1) = \ell_6 \cap \ell_{13}$
$P_{287} = (6,2,3,1) = \ell_6 \cap \ell_{14}$
$P_{18} = (7,0,1,0) = \ell_7 \cap \ell_8$
$P_{148} = (3,1,1,1) = \ell_7 \cap \ell_{12}$
$P_{273} = (0,1,3,1) = \ell_7 \cap \ell_{13}$
$P_{428} = (3,4,5,1) = \ell_8 \cap \ell_9$
$P_{174} = (5,4,1,1) = \ell_8 \cap \ell_{10}$
$P_{303} = (6,4,3,1) = \ell_8 \cap \ell_{12}$
$P_{553} = (0,4,7,1) = \ell_8 \cap \ell_{14}$
$P_{29} = (2,2,1,0) = \ell_9 \cap \ell_{10}$
$P_{565} = (4,5,7,1) = \ell_{10} \cap \ell_{11}$
$P_{355} = (2,3,4,1) = \ell_{10} \cap \ell_{13}$
$P_{47} = (4,4,1,0) = \ell_{11} \cap \ell_{12}$
$P_{256} = (7,6,2,1) = \ell_{11} \cap \ell_{13}$
$P_{74} = (7,7,1,0) = \ell_{13} \cap \ell_{14}$

Single Points

The surface has 48 single points:
The single points on the surface are:

$0 : P_{76} = (2,0,0,1)$ lies on line ℓ_0
$1 : P_{78} = (4,0,0,1)$ lies on line ℓ_1
$2 : P_{81} = (7,0,0,1)$ lies on line ℓ_2
$3 : P_{92} = (2,2,0,1)$ lies on line ℓ_0
$4 : P_{94} = (4,2,0,1)$ lies on line ℓ_1
$5 : P_{105} = (7,3,0,1)$ lies on line ℓ_2
$6 : P_{110} = (4,4,0,1)$ lies on line ℓ_1
$7 : P_{113} = (7,4,0,1)$ lies on line ℓ_2
$8 : P_{116} = (2,5,0,1)$ lies on line ℓ_0
$9 : P_{126} = (4,6,0,1)$ lies on line ℓ_1
$10 : P_{132} = (2,7,0,1)$ lies on line ℓ_0
$11 : P_{137} = (7,7,0,1)$ lies on line ℓ_2
$12 : P_{203} = (2,0,2,1)$ lies on line ℓ_{12}
$13 : P_{212} = (3,1,2,1)$ lies on line ℓ_3
$14 : P_{219} = (2,2,2,1)$ lies on line ℓ_6
$15 : P_{220} = (3,2,2,1)$ lies on line ℓ_{10}
$16 : P_{234} = (1,4,2,1)$ lies on line ℓ_8
$17 : P_{242} = (1,5,2,1)$ lies on line ℓ_{14}
$18 : P_{266} = (1,0,3,1)$ lies on line ℓ_{10}
$19 : P_{274} = (1,1,3,1)$ lies on line ℓ_3
$20 : P_{276} = (3,1,3,1)$ lies on line ℓ_5
$21 : P_{284} = (3,2,3,1)$ lies on line ℓ_{11}
$22 : P_{307} = (2,5,3,1)$ lies on line ℓ_9
$23 : P_{323} = (2,7,3,1)$ lies on line ℓ_4
$24 : P_{333} = (4,0,4,1)$ lies on line ℓ_{14}

$25 : P_{342} = (5,1,4,1)$ lies on line ℓ_5
$26 : P_{365} = (4,4,4,1)$ lies on line ℓ_8
$27 : P_{366} = (5,4,4,1)$ lies on line ℓ_{11}
$28 : P_{378} = (1,6,4,1)$ lies on line ℓ_9
$29 : P_{386} = (1,7,4,1)$ lies on line ℓ_4
$30 : P_{394} = (1,0,5,1)$ lies on line ℓ_{11}
$31 : P_{402} = (1,1,5,1)$ lies on line ℓ_5
$32 : P_{406} = (5,1,5,1)$ lies on line ℓ_7
$33 : P_{413} = (4,2,5,1)$ lies on line ℓ_6
$34 : P_{430} = (5,4,5,1)$ lies on line ℓ_{13}
$35 : P_{445} = (4,6,5,1)$ lies on line ℓ_{12}
$36 : P_{458} = (1,0,6,1)$ lies on line ℓ_{13}
$37 : P_{466} = (1,1,6,1)$ lies on line ℓ_7
$38 : P_{471} = (6,1,6,1)$ lies on line ℓ_3
$39 : P_{488} = (7,3,6,1)$ lies on line ℓ_{14}
$40 : P_{496} = (7,4,6,1)$ lies on line ℓ_8
$41 : P_{519} = (6,7,6,1)$ lies on line ℓ_{10}
$42 : P_{528} = (7,0,7,1)$ lies on line ℓ_9
$43 : P_{535} = (6,1,7,1)$ lies on line ℓ_7
$44 : P_{538} = (1,2,7,1)$ lies on line ℓ_6
$45 : P_{546} = (1,3,7,1)$ lies on line ℓ_{12}
$46 : P_{583} = (6,7,7,1)$ lies on line ℓ_{13}
$47 : P_{584} = (7,7,7,1)$ lies on line ℓ_4

The single points on the surface are:

Points on surface but on no line

The surface has 14 points not on any line:
The points on the surface but not on lines are:

0 : $P_{19} = (0, 1, 1, 0)$
1 : $P_{32} = (5, 2, 1, 0)$
2 : $P_{33} = (6, 2, 1, 0)$
3 : $P_{46} = (3, 4, 1, 0)$
4 : $P_{49} = (6, 4, 1, 0)$
5 : $P_{70} = (3, 7, 1, 0)$
6 : $P_{72} = (5, 7, 1, 0)$
7 : $P_{138} = (0, 0, 1, 1)$

8 : $P_{288} = (7, 2, 3, 1)$
9 : $P_{312} = (7, 5, 3, 1)$
10 : $P_{427} = (2, 4, 5, 1)$
11 : $P_{443} = (2, 6, 5, 1)$
12 : $P_{485} = (4, 3, 6, 1)$
13 : $P_{517} = (4, 7, 6, 1)$

Line Intersection Graph

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
0	0	1	1	0	0	1	0	0	1	0	0	1	0	0	1
1	1	0	1	0	1	0	0	1	0	1	0	0	0	1	0
2	1	1	0	1	0	0	1	0	0	0	1	0	1	0	0
3	0	0	1	0	1	1	0	1	0	0	1	0	0	0	1
4	0	1	0	1	0	0	0	0	0	1	0	1	1	0	1
5	1	0	0	1	0	0	1	1	0	1	0	1	0	0	0
6	0	0	1	0	0	1	0	0	0	1	0	0	1	1	1
7	0	1	0	1	0	1	0	0	1	0	0	1	1	0	0
8	1	0	0	0	0	0	0	1	0	1	1	0	1	0	1
9	0	1	0	0	1	1	1	0	1	0	1	0	0	0	0
10	0	0	1	1	0	0	0	0	1	1	0	1	0	1	0
11	1	0	0	0	1	1	0	0	0	0	1	0	1	1	0
12	0	0	1	0	1	0	1	1	1	0	0	1	0	0	0
13	0	1	0	0	0	0	1	1	0	0	1	1	0	0	1
14	1	0	0	1	1	1	0	1	0	1	0	0	0	1	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_5	ℓ_8	ℓ_{11}	ℓ_{14}
in point	P_1	P_1	P_{84}	P_{108}	P_{100}	P_{124}

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_4	ℓ_7	ℓ_9	ℓ_{13}
in point	P_1	P_1	P_{134}	P_{86}	P_{102}	P_{118}

Line 2 intersects

Line	ℓ_0	ℓ_1	ℓ_3	ℓ_6	ℓ_{10}	ℓ_{12}
in point	P_1	P_1	P_{89}	P_{97}	P_{129}	P_{121}

Line 3 intersects

Line	ℓ_2	ℓ_4	ℓ_5	ℓ_7	ℓ_{10}	ℓ_{14}
in point	P_{89}	P_{13}	P_{533}	P_{339}	P_{401}	P_{150}

Line 4 intersects

Line	ℓ_1	ℓ_3	ℓ_9	ℓ_{11}	ℓ_{12}	ℓ_{14}
in point	P_{134}	P_{13}	P_{257}	P_{199}	P_{518}	P_{452}

Line 5 intersects

Line	ℓ_0	ℓ_3	ℓ_6	ℓ_7	ℓ_9	ℓ_{11}
in point	P_{84}	P_{533}	P_{15}	P_{216}	P_{151}	P_{465}

Line 6 intersects

Line	ℓ_2	ℓ_5	ℓ_9	ℓ_{12}	ℓ_{13}	ℓ_{14}
in point	P_{97}	P_{15}	P_{478}	P_{345}	P_{156}	P_{287}

Line 7 intersects

Line	ℓ_1	ℓ_3	ℓ_5	ℓ_8	ℓ_{12}	ℓ_{13}
in point	P_{86}	P_{339}	P_{216}	P_{18}	P_{148}	P_{273}

Line 8 intersects

Line	ℓ_0	ℓ_7	ℓ_9	ℓ_{10}	ℓ_{12}	ℓ_{14}
in point	P_{108}	P_{18}	P_{428}	P_{174}	P_{303}	P_{553}

Line 9 intersects

Line	ℓ_1	ℓ_4	ℓ_5	ℓ_6	ℓ_8	ℓ_{10}
in point	P_{102}	P_{257}	P_{151}	P_{478}	P_{428}	P_{29}

Line 10 intersects

Line	ℓ_2	ℓ_3	ℓ_8	ℓ_9	ℓ_{11}	ℓ_{13}
in point	P_{129}	P_{401}	P_{174}	P_{29}	P_{565}	P_{355}

Line 11 intersects

Line	ℓ_0	ℓ_4	ℓ_5	ℓ_{10}	ℓ_{12}	ℓ_{13}
in point	P_{100}	P_{199}	P_{465}	P_{565}	P_{47}	P_{256}

Line 12 intersects

Line	ℓ_2	ℓ_4	ℓ_6	ℓ_7	ℓ_8	ℓ_{11}
in point	P_{121}	P_{518}	P_{345}	P_{148}	P_{303}	P_{47}

Line 13 intersects

Line	ℓ_1	ℓ_6	ℓ_7	ℓ_{10}	ℓ_{11}	ℓ_{14}
in point	P_{118}	P_{156}	P_{273}	P_{355}	P_{256}	P_{74}

Line 14 intersects

Line	ℓ_0	ℓ_3	ℓ_4	ℓ_6	ℓ_8	ℓ_{13}
in point	P_{124}	P_{150}	P_{452}	P_{287}	P_{553}	P_{74}

The surface has 105 points:
The points on the surface are:

$0:\ P_1 = (0,1,0,0)$
$1:\ P_{13} = (2,0,1,0)$
$2:\ P_{15} = (4,0,1,0)$
$3:\ P_{18} = (7,0,1,0)$
$4:\ P_{19} = (0,1,1,0)$
$5:\ P_{29} = (2,2,1,0)$
$6:\ P_{32} = (5,2,1,0)$
$7:\ P_{33} = (6,2,1,0)$
$8:\ P_{46} = (3,4,1,0)$
$9:\ P_{47} = (4,4,1,0)$
$10:\ P_{49} = (6,4,1,0)$
$11:\ P_{70} = (3,7,1,0)$
$12:\ P_{72} = (5,7,1,0)$
$13:\ P_{74} = (7,7,1,0)$
$14:\ P_{76} = (2,0,0,1)$
$15:\ P_{78} = (4,0,0,1)$
$16:\ P_{81} = (7,0,0,1)$
$17:\ P_{84} = (2,1,0,1)$
$18:\ P_{86} = (4,1,0,1)$
$19:\ P_{89} = (7,1,0,1)$

$20:\ P_{92} = (2,2,0,1)$
$21:\ P_{94} = (4,2,0,1)$
$22:\ P_{97} = (7,2,0,1)$
$23:\ P_{100} = (2,3,0,1)$
$24:\ P_{102} = (4,3,0,1)$
$25:\ P_{105} = (7,3,0,1)$
$26:\ P_{108} = (2,4,0,1)$
$27:\ P_{110} = (4,4,0,1)$
$28:\ P_{113} = (7,4,0,1)$
$29:\ P_{116} = (2,5,0,1)$
$30:\ P_{118} = (4,5,0,1)$
$31:\ P_{121} = (7,5,0,1)$
$32:\ P_{124} = (2,6,0,1)$
$33:\ P_{126} = (4,6,0,1)$
$34:\ P_{129} = (7,6,0,1)$
$35:\ P_{132} = (2,7,0,1)$
$36:\ P_{134} = (4,7,0,1)$
$37:\ P_{137} = (7,7,0,1)$
$38:\ P_{138} = (0,0,1,1)$
$39:\ P_{148} = (3,1,1,1)$

$40:\ P_{150} = (5,1,1,1)$
$41:\ P_{151} = (6,1,1,1)$
$42:\ P_{156} = (3,2,1,1)$
$43:\ P_{174} = (5,4,1,1)$
$44:\ P_{199} = (6,7,1,1)$
$45:\ P_{203} = (2,0,2,1)$
$46:\ P_{212} = (3,1,2,1)$
$47:\ P_{216} = (7,1,2,1)$
$48:\ P_{219} = (2,2,2,1)$
$49:\ P_{220} = (3,2,2,1)$
$50:\ P_{234} = (1,4,2,1)$
$51:\ P_{242} = (1,5,2,1)$
$52:\ P_{256} = (7,6,2,1)$
$53:\ P_{257} = (0,7,2,1)$
$54:\ P_{266} = (1,0,3,1)$
$55:\ P_{273} = (0,1,3,1)$
$56:\ P_{274} = (1,1,3,1)$
$57:\ P_{276} = (3,1,3,1)$
$58:\ P_{284} = (3,2,3,1)$
$59:\ P_{287} = (6,2,3,1)$

$60: P_{288} = (7, 2, 3, 1)$
$61: P_{303} = (6, 4, 3, 1)$
$62: P_{307} = (2, 5, 3, 1)$
$63: P_{312} = (7, 5, 3, 1)$
$64: P_{323} = (2, 7, 3, 1)$
$65: P_{333} = (4, 0, 4, 1)$
$66: P_{339} = (2, 1, 4, 1)$
$67: P_{342} = (5, 1, 4, 1)$
$68: P_{345} = (0, 2, 4, 1)$
$69: P_{355} = (2, 3, 4, 1)$
$70: P_{365} = (4, 4, 4, 1)$
$71: P_{366} = (5, 4, 4, 1)$
$72: P_{378} = (1, 6, 4, 1)$
$73: P_{386} = (1, 7, 4, 1)$
$74: P_{394} = (1, 0, 5, 1)$
$75: P_{401} = (0, 1, 5, 1)$

$76: P_{402} = (1, 1, 5, 1)$
$77: P_{406} = (5, 1, 5, 1)$
$78: P_{413} = (4, 2, 5, 1)$
$79: P_{427} = (2, 4, 5, 1)$
$80: P_{428} = (3, 4, 5, 1)$
$81: P_{430} = (5, 4, 5, 1)$
$82: P_{443} = (2, 6, 5, 1)$
$83: P_{445} = (4, 6, 5, 1)$
$84: P_{452} = (3, 7, 5, 1)$
$85: P_{458} = (1, 0, 6, 1)$
$86: P_{465} = (0, 1, 6, 1)$
$87: P_{466} = (1, 1, 6, 1)$
$88: P_{471} = (6, 1, 6, 1)$
$89: P_{478} = (5, 2, 6, 1)$
$90: P_{485} = (4, 3, 6, 1)$
$91: P_{488} = (7, 3, 6, 1)$

$92: P_{496} = (7, 4, 6, 1)$
$93: P_{517} = (4, 7, 6, 1)$
$94: P_{518} = (5, 7, 6, 1)$
$95: P_{519} = (6, 7, 6, 1)$
$96: P_{528} = (7, 0, 7, 1)$
$97: P_{533} = (4, 1, 7, 1)$
$98: P_{535} = (6, 1, 7, 1)$
$99: P_{538} = (1, 2, 7, 1)$
$100: P_{546} = (1, 3, 7, 1)$
$101: P_{553} = (0, 4, 7, 1)$
$102: P_{565} = (4, 5, 7, 1)$
$103: P_{583} = (6, 7, 7, 1)$
$104: P_{584} = (7, 7, 7, 1)$