# Rank-65666 over GF(4)

January 15, 2021

## The equation

The equation of the surface is :

$$X_0^3 + X_1^3 + X_2^3 + X_3^3 + X_0^2X_1 + X_0^2X_2 + X_0^2X_3 + X_0X_1X_2 = 0$$

( 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0 )
The point rank of the equation over GF(4) is 1431661230

## General information

| | |
|---|---|
| Number of lines | 0 |
| Number of points | 25 |
| Number of singular points | 0 |
| Number of Eckardt points | 0 |
| Number of double points | 0 |
| Number of single points | 0 |
| Number of points off lines | 25 |
| Number of Hesse planes | 0 |
| Number of axes | 0 |
| Type of points on lines | |
| Type of lines on points | $0^{25}$ |

### Singular Points

The surface has 0 singular points:

## The 0 Lines

The lines and their Pluecker coordinates are:
Rank of lines: ( )
Rank of points on Klein quadric: ( )

**Eckardt Points**

The surface has 0 Eckardt points:

**Double Points**

The surface has 0 Double points:
The double points on the surface are:

**Single Points**

The surface has 0 single points:
The single points on the surface are:

The single points on the surface are:

**Points on surface but on no line**

The surface has 25 points not on any line:
The points on the surface but not on lines are:

$0: P_4 = (1,1,1,1)$
$1: P_{11} = (0,1,1,0)$
$2: P_{12} = (1,1,1,0)$
$3: P_{15} = (0,2,1,0)$
$4: P_{16} = (1,2,1,0)$
$5: P_{17} = (2,2,1,0)$
$6: P_{19} = (0,3,1,0)$
$7: P_{20} = (1,3,1,0)$
$8: P_{22} = (3,3,1,0)$
$9: P_{26} = (0,1,0,1)$
$10: P_{30} = (0,2,0,1)$
$11: P_{33} = (3,2,0,1)$
$12: P_{34} = (0,3,0,1)$
$13: P_{36} = (2,3,0,1)$
$14: P_{38} = (0,0,1,1)$
$15: P_{46} = (1,2,1,1)$
$16: P_{50} = (1,3,1,1)$
$17: P_{53} = (0,0,2,1)$
$18: P_{56} = (3,0,2,1)$
$19: P_{58} = (1,1,2,1)$
$20: P_{64} = (3,2,2,1)$
$21: P_{69} = (0,0,3,1)$
$22: P_{71} = (2,0,3,1)$
$23: P_{74} = (1,1,3,1)$
$24: P_{83} = (2,3,3,1)$

## Line Intersection Graph

Neighbor sets in the line intersection graph:
The surface has 25 points:
The points on the surface are:

$0: P_4 = (1,1,1,1)$
$1: P_{11} = (0,1,1,0)$
$2: P_{12} = (1,1,1,0)$
$3: P_{15} = (0,2,1,0)$
$4: P_{16} = (1,2,1,0)$
$5: P_{17} = (2,2,1,0)$
$6: P_{19} = (0,3,1,0)$
$7: P_{20} = (1,3,1,0)$
$8: P_{22} = (3,3,1,0)$
$9: P_{26} = (0,1,0,1)$
$10: P_{30} = (0,2,0,1)$
$11: P_{33} = (3,2,0,1)$
$12: P_{34} = (0,3,0,1)$
$13: P_{36} = (2,3,0,1)$
$14: P_{38} = (0,0,1,1)$

$15: P_{46} = (1, 2, 1, 1)$
$16: P_{50} = (1, 3, 1, 1)$
$17: P_{53} = (0, 0, 2, 1)$
$18: P_{56} = (3, 0, 2, 1)$
$19: P_{58} = (1, 1, 2, 1)$
$20: P_{64} = (3, 2, 2, 1)$
$21: P_{69} = (0, 0, 3, 1)$
$22: P_{71} = (2, 0, 3, 1)$
$23: P_{74} = (1, 1, 3, 1)$
$24: P_{83} = (2, 3, 3, 1)$