

Rank-74263 over GF(4)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 1, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0)

The point rank of the equation over GF(4) is 1499027049

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 : $P_0 = (1, 0, 0, 0)$	13 : $P_{54} = (1, 0, 2, 1)$
1 : $P_1 = (0, 1, 0, 0)$	14 : $P_{57} = (0, 1, 2, 1)$
2 : $P_3 = (0, 0, 0, 1)$	15 : $P_{60} = (3, 1, 2, 1)$
3 : $P_{13} = (2, 1, 1, 0)$	16 : $P_{63} = (2, 2, 2, 1)$
4 : $P_{14} = (3, 1, 1, 0)$	17 : $P_{64} = (3, 2, 2, 1)$
5 : $P_{28} = (2, 1, 0, 1)$	18 : $P_{66} = (1, 3, 2, 1)$
6 : $P_{29} = (3, 1, 0, 1)$	19 : $P_{70} = (1, 0, 3, 1)$
7 : $P_{31} = (1, 2, 0, 1)$	20 : $P_{73} = (0, 1, 3, 1)$
8 : $P_{32} = (2, 2, 0, 1)$	21 : $P_{75} = (2, 1, 3, 1)$
9 : $P_{35} = (1, 3, 0, 1)$	22 : $P_{78} = (1, 2, 3, 1)$
10 : $P_{37} = (3, 3, 0, 1)$	23 : $P_{83} = (2, 3, 3, 1)$
11 : $P_{39} = (1, 0, 1, 1)$	24 : $P_{84} = (3, 3, 3, 1)$
12 : $P_{42} = (0, 1, 1, 1)$	

Line Intersection Graph

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Neighbor sets in the line intersection graph:

The surface has 25 points:

The points on the surface are:

0 : $P_0 = (1, 0, 0, 0)$	5 : $P_{28} = (2, 1, 0, 1)$	10 : $P_{37} = (3, 3, 0, 1)$
1 : $P_1 = (0, 1, 0, 0)$	6 : $P_{29} = (3, 1, 0, 1)$	11 : $P_{39} = (1, 0, 1, 1)$
2 : $P_3 = (0, 0, 0, 1)$	7 : $P_{31} = (1, 2, 0, 1)$	12 : $P_{42} = (0, 1, 1, 1)$
3 : $P_{13} = (2, 1, 1, 0)$	8 : $P_{32} = (2, 2, 0, 1)$	13 : $P_{54} = (1, 0, 2, 1)$
4 : $P_{14} = (3, 1, 1, 0)$	9 : $P_{35} = (1, 3, 0, 1)$	14 : $P_{57} = (0, 1, 2, 1)$

$$\begin{aligned} 15 : P_{60} &= (3, 1, 2, 1) \\ 16 : P_{63} &= (2, 2, 2, 1) \\ 17 : P_{64} &= (3, 2, 2, 1) \\ 18 : P_{66} &= (1, 3, 2, 1) \end{aligned}$$

$$\begin{aligned} 19 : P_{70} &= (1, 0, 3, 1) \\ 20 : P_{73} &= (0, 1, 3, 1) \\ 21 : P_{75} &= (2, 1, 3, 1) \\ 22 : P_{78} &= (1, 2, 3, 1) \end{aligned}$$

$$\begin{aligned} 23 : P_{83} &= (2, 3, 3, 1) \\ 24 : P_{84} &= (3, 3, 3, 1) \end{aligned}$$