Rank-74280 over GF(4)

January 15, 2021

The equation

The equation of the surface is :

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

(1, 0, 1, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(4) is 1499027818

General information

Number of lines	0
Number of points	21
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	21
Number of Hesse planes	0
Number of axes	0
Type of points on lines	
Type of lines on points	0^{21}

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

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

1 : $P_3 = (0, 0, 0, 1)$

2 : $P_4 = (1, 1, 1, 1)$

3 : $P_{12} = (1, 1, 1, 0)$

4 : $P_{17} = (2, 2, 1, 0)$

5 : $P_{22} = (3, 3, 1, 0)$

6 : $P_{23} = (1, 0, 0, 1)$

7 : $P_{32} = (2, 2, 0, 1)$

8 : $P_{37} = (3, 3, 0, 1)$

9 : $P_{39} = (1, 0, 1, 1)$

10 : $P_{42} = (0, 1, 1, 1)$

11 : $P_{56} = (3, 0, 2, 1)$

12 : $P_{57} = (0, 1, 2, 1)$

13 : $P_{58} = (1, 1, 2, 1)$

14 : $P_{60} = (3, 1, 2, 1)$

15 : $P_{66} = (1, 3, 2, 1)$

16 : $P_{71} = (2, 0, 3, 1)$

17 : $P_{73} = (0, 1, 3, 1)$

18 : $P_{74} = (1, 1, 3, 1)$

19 : $P_{75} = (2, 1, 3, 1)$

20 : $P_{78} = (1, 2, 3, 1)$

Line Intersection Graph

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Neighbor sets in the line intersection graph:
The surface has 21 points:
The points on the surface are:

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

1 : $P_3 = (0, 0, 0, 1)$

2 : $P_4 = (1, 1, 1, 1)$

3 : $P_{12} = (1, 1, 1, 0)$

4 : $P_{17} = (2, 2, 1, 0)$

5 : $P_{22} = (3, 3, 1, 0)$

6 : $P_{23} = (1, 0, 0, 1)$

7 : $P_{32} = (2, 2, 0, 1)$

8 : $P_{37} = (3, 3, 0, 1)$

9 : $P_{39} = (1, 0, 1, 1)$

10 : $P_{42} = (0, 1, 1, 1)$

11 : $P_{56} = (3, 0, 2, 1)$

12 : $P_{57} = (0, 1, 2, 1)$

13 : $P_{58} = (1, 1, 2, 1)$

14 : $P_{60} = (3, 1, 2, 1)$

15 : $P_{66} = (1, 3, 2, 1)$

16 : $P_{71} = (2, 0, 3, 1)$

17 : $P_{73} = (0, 1, 3, 1)$

18 : $P_{74} = (1, 1, 3, 1)$

19 : $P_{75} = (2, 1, 3, 1)$

20 : $P_{78} = (1, 2, 3, 1)$