

Rank-65872 over GF(4)

January 15, 2021

The equation

The equation of the surface is :

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

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

The point rank of the equation over GF(4) is 1431725482

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 : $P_1 = (0, 1, 0, 0)$	11 : $P_{53} = (0, 0, 2, 1)$
1 : $P_4 = (1, 1, 1, 1)$	12 : $P_{54} = (1, 0, 2, 1)$
2 : $P_8 = (1, 0, 1, 0)$	13 : $P_{58} = (1, 1, 2, 1)$
3 : $P_9 = (2, 0, 1, 0)$	14 : $P_{60} = (3, 1, 2, 1)$
4 : $P_{10} = (3, 0, 1, 0)$	15 : $P_{64} = (3, 2, 2, 1)$
5 : $P_{11} = (0, 1, 1, 0)$	16 : $P_{69} = (0, 0, 3, 1)$
6 : $P_{12} = (1, 1, 1, 0)$	17 : $P_{70} = (1, 0, 3, 1)$
7 : $P_{17} = (2, 2, 1, 0)$	18 : $P_{74} = (1, 1, 3, 1)$
8 : $P_{22} = (3, 3, 1, 0)$	19 : $P_{75} = (2, 1, 3, 1)$
9 : $P_{38} = (0, 0, 1, 1)$	20 : $P_{83} = (2, 3, 3, 1)$
10 : $P_{39} = (1, 0, 1, 1)$	

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 : $P_1 = (0, 1, 0, 0)$	8 : $P_{22} = (3, 3, 1, 0)$	16 : $P_{69} = (0, 0, 3, 1)$
1 : $P_4 = (1, 1, 1, 1)$	9 : $P_{38} = (0, 0, 1, 1)$	17 : $P_{70} = (1, 0, 3, 1)$
2 : $P_8 = (1, 0, 1, 0)$	10 : $P_{39} = (1, 0, 1, 1)$	18 : $P_{74} = (1, 1, 3, 1)$
3 : $P_9 = (2, 0, 1, 0)$	11 : $P_{53} = (0, 0, 2, 1)$	19 : $P_{75} = (2, 1, 3, 1)$
4 : $P_{10} = (3, 0, 1, 0)$	12 : $P_{54} = (1, 0, 2, 1)$	20 : $P_{83} = (2, 3, 3, 1)$
5 : $P_{11} = (0, 1, 1, 0)$	13 : $P_{58} = (1, 1, 2, 1)$	
6 : $P_{12} = (1, 1, 1, 0)$	14 : $P_{60} = (3, 1, 2, 1)$	
7 : $P_{17} = (2, 2, 1, 0)$	15 : $P_{64} = (3, 2, 2, 1)$	