Rank-65617 over GF(4)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 1, 1, 1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(4) is 1431659949

General information

Number of lines	0
Number of points	17
Number of singular points	1
Number of Eckardt points	0
Number of double points	0
Number of single points	0
Number of points off lines	17
Number of Hesse planes	0
Number of axes	0
Type of points on lines	
Type of lines on points	0^{17}

Singular Points

The surface has 1 singular points:

$0 : \ P_{23} = \mathbf{P}(1,0,0,1) = \mathbf{P}(1,0,0,1)$

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

$0: P_0 = (1,0,0,0)$
$1: P_{11} = (0,1,1,0)$
$2: P_{15} = (0,2,1,0)$
$3: P_{19} = (0,3,1,0)$
$4: P_{23} = (1,0,0,1)$
$5: P_{26} = (0,1,0,1)$
$6: P_{30} = (0,2,0,1)$
$7: P_{34} = (0,3,0,1)$
$8: P_{38} = (0,0,1,1)$
$9: P_{43} = (2,1,1,1)$
$10: P_{44} = (3,1,1,1)$
$11: P_{53} = (0,0,2,1)$
$12: P_{67} = (2,3,2,1)$
$13: P_{68} = (3,3,2,1)$
$14: P_{69} = (0,0,3,1)$
$15: P_{79} = (2,2,3,1)$
$16: P_{80} = (3,2,3,1)$

Line Intersection Graph

Neighbor sets in the line intersection graph:
The surface has 17 points:
The points on the surface are:

$0: P_0 = (1,0,0,0)$
$1: P_{11} = (0,1,1,0)$
$2: P_{15} = (0,2,1,0)$
$3: P_{19} = (0,3,1,0)$
$4: P_{23} = (1,0,0,1)$
$5: P_{26} = (0,1,0,1)$
$6: P_{30} = (0,2,0,1)$
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$15: P_{79} = (2,2,3,1)$
$16: P_{80} = (3,2,3,1)$