Rank-65851 over GF(4)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 0, 1, 1, 1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(4) is 1431722649

General information

Number of lines	0
Number of points	13
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	13
Number of Hesse planes	0
Number of axes	0
Type of points on lines	
Type of lines on points	0^{13}

Singular Points

The surface has 1 singular points:

$0 : \ P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$

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

$0: P_0 = (1,0,0,0)$
$1: P_1 = (0,1,0,0)$
$2: P_2 = (0,0,1,0)$
$3: P_{12} = (1,1,1,0)$
$4: P_{27} = (1,1,0,1)$
$5: P_{32} = (2,2,0,1)$
$6: P_{37} = (3,3,0,1)$
$7: P_{39} = (1,0,1,1)$
$8: P_{42} = (0,1,1,1)$
$9: P_{55} = (2,0,2,1)$
$10: P_{61} = (0,2,2,1)$
$11: P_{72} = (3,0,3,1)$
$12: P_{81} = (0,3,3,1)$

Line Intersection Graph

Neighbor sets in the line intersection graph:
The surface has 13 points:
The points on the surface are:

$0: P_0 = (1,0,0,0)$
$1: P_1 = (0,1,0,0)$
$2: P_2 = (0,0,1,0)$
$3: P_{12} = (1,1,1,0)$
$4: P_{27} = (1,1,0,1)$
$5: P_{32} = (2,2,0,1)$
$6: P_{37} = (3,3,0,1)$
$7: P_{39} = (1,0,1,1)$
$8: P_{42} = (0,1,1,1)$
$9: P_{55} = (2,0,2,1)$
$10: P_{61} = (0,2,2,1)$
$11: P_{72} = (3,0,3,1)$
$12: P_{81} = (0,3,3,1)$