Rank-73798 over GF(2)

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The equation

The equation of the surface is :

$$X_0^3 + X_1^3 + X_0^2X_3 + X_0X_3^2 + X_0X_1X_2 = 0$$

(1, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(2) is 73798

General information

Number of lines	1
Number of points	5
Number of singular points	1
Number of Eckardt points	0
Number of double points	0
Number of single points	3
Number of points off lines	2
Number of Hesse planes	0
Number of axes	0
Type of points on lines	3
Type of lines on points	1^3, 0^2

Singular Points

The surface has 1 singular points:

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

The 1 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{34} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{34} = \mathbf{Pl}(0,1,0,0,0,0)_1$$

Rank of lines: (34)
Rank of points on Klein quadric: (1)

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 3 single points:
The single points on the surface are:

$0:\ P_2 = (0,0,1,0)$ lies on line ℓ_0
$1:\ P_3 = (0,0,0,1)$ lies on line ℓ_0
$2:\ P_{12} = (0,0,1,1)$ lies on line ℓ_0

The single points on the surface are:

Points on surface but on no line

The surface has 2 points not on any line:
The points on the surface but not on lines are:

$0:\ P_5 = (1,1,0,0)$
$1:\ P_{11} = (1,1,0,1)$

Line Intersection Graph

	0
0	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line
in point

The surface has 5 points:
The points on the surface are:

$0:\ P_2 = (0,0,1,0)$
$1:\ P_3 = (0,0,0,1)$
$2:\ P_5 = (1,1,0,0)$
$3:\ P_{11} = (1,1,0,1)$
$4:\ P_{12} = (0,0,1,1)$