Rank-65634 over GF(8)

January 15, 2021

The equation

The equation of the surface is :

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

(1, 1, 1, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(8) is 1227400342

General information

Number of lines	0
Number of points	65
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	65
Number of Hesse planes	0
Number of axes	0
Type of points on lines	
Type of lines on points	0^{65}

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

$0 : P_6 = (2, 1, 0, 0)$	$27 : P_{150} = (5, 1, 1, 1)$
$1 : P_8 = (4, 1, 0, 0)$	$28 : P_{151} = (6, 1, 1, 1)$
$2 : P_{11} = (7, 1, 0, 0)$	$29 : P_{207} = (6, 0, 2, 1)$
$3 : P_{12} = (1, 0, 1, 0)$	$30 : P_{219} = (2, 2, 2, 1)$
$4 : P_{19} = (0, 1, 1, 0)$	$31 : P_{220} = (3, 2, 2, 1)$
$5 : P_{29} = (2, 2, 1, 0)$	$32 : P_{241} = (0, 5, 2, 1)$
$6 : P_{34} = (7, 2, 1, 0)$	$33 : P_{263} = (6, 7, 2, 1)$
$7 : P_{39} = (4, 3, 1, 0)$	$34 : P_{274} = (1, 1, 3, 1)$
$8 : P_{45} = (2, 4, 1, 0)$	$35 : P_{298} = (1, 4, 3, 1)$
$9 : P_{47} = (4, 4, 1, 0)$	$36 : P_{302} = (5, 4, 3, 1)$
$10 : P_{58} = (7, 5, 1, 0)$	$37 : P_{306} = (1, 5, 3, 1)$
$11 : P_{61} = (2, 6, 1, 0)$	$38 : P_{308} = (3, 5, 3, 1)$
$12 : P_{71} = (4, 7, 1, 0)$	$39 : P_{311} = (6, 5, 3, 1)$
$13 : P_{74} = (7, 7, 1, 0)$	$40 : P_{321} = (0, 7, 3, 1)$
$14 : P_{76} = (2, 0, 0, 1)$	$41 : P_{332} = (3, 0, 4, 1)$
$15 : P_{78} = (4, 0, 0, 1)$	$42 : P_{348} = (3, 2, 4, 1)$
$16 : P_{81} = (7, 0, 0, 1)$	$43 : P_{365} = (4, 4, 4, 1)$
$17 : P_{82} = (0, 1, 0, 1)$	$44 : P_{366} = (5, 4, 4, 1)$
$18 : P_{92} = (2, 2, 0, 1)$	$45 : P_{377} = (0, 6, 4, 1)$
$19 : P_{99} = (1, 3, 0, 1)$	$46 : P_{402} = (1, 1, 5, 1)$
$20 : P_{110} = (4, 4, 0, 1)$	$47 : P_{409} = (0, 2, 5, 1)$
$21 : P_{115} = (1, 5, 0, 1)$	$48 : P_{442} = (1, 6, 5, 1)$
$22 : P_{123} = (1, 6, 0, 1)$	$49 : P_{444} = (3, 6, 5, 1)$
$23 : P_{137} = (7, 7, 0, 1)$	$50 : P_{446} = (5, 6, 5, 1)$
$24 : P_{138} = (0, 0, 1, 1)$	$51 : P_{450} = (1, 7, 5, 1)$
$25 : P_{139} = (1, 0, 1, 1)$	$52 : P_{455} = (6, 7, 5, 1)$
$26 : P_{148} = (3, 1, 1, 1)$	$53 : P_{466} = (1, 1, 6, 1)$

$54 : P_{474} = (1, 2, 6, 1)$
$55 : P_{476} = (3, 2, 6, 1)$
$56 : P_{482} = (1, 3, 6, 1)$
$57 : P_{486} = (5, 3, 6, 1)$
$58 : P_{487} = (6, 3, 6, 1)$
$59 : P_{489} = (0, 4, 6, 1)$

$60 : P_{526} = (5, 0, 7, 1)$
$61 : P_{545} = (0, 3, 7, 1)$
$62 : P_{558} = (5, 4, 7, 1)$
$63 : P_{583} = (6, 7, 7, 1)$
$64 : P_{584} = (7, 7, 7, 1)$

Line Intersection Graph

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Neighbor sets in the line intersection graph:
The surface has 65 points:
The points on the surface are:

$0 : P_6 = (2, 1, 0, 0)$
$1 : P_8 = (4, 1, 0, 0)$
$2 : P_{11} = (7, 1, 0, 0)$
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