

===== surfaces-register =====

FIELDS: $(a=1, p=5)$, $\$k=\mathbb{Q}\$, \ell=\mathbb{Q}[i]\$$

DETERMINANT: $\det(x)=D(x)$, a power of $(3+4i)/5$, modulo cubes

CLASS: $(a=1, p=5, \emptyset)$

FPP/3: $(a=1, p=5, \emptyset)$

AUTOMORPHISM GROUP: trivial

ABELIANIZATION: $C_2 \times C_4 \times C_3$

FUNDAMENTAL GROUP: $C_2 \times C_4$

FIRST HOMOLOGY: $C_2 \times C_4$

COVERED BY: $(a=1, p=5, \emptyset, D_3)$ index 3, regular
 $(a=1, p=5, \{2I\})$ index 3, not regular

FPP: $(a=1, p=5, \emptyset, D_3)$

AUTOMORPHISM GROUP: C_3

FIRST HOMOLOGY: $C_2 \times C_4 \times C_3$

COVERS: $(a=1, p=5, \emptyset)$ index 3, regular

CLASS: $(a=1, p=5, \{2\})$

FPP/3: $(a=1, p=5, \{2\})$

AUTOMORPHISM GROUP: trivial

ABELIANIZATION: $C_4 \times C_3$

FUNDAMENTAL GROUP: C_4

FIRST HOMOLOGY: C_4

COVERED BY: $(a=1, p=5, \{2\}, D_3)$ index 3, regular
 $(a=1, p=5, \{2I\})$ index 3, not regular

FPP: $(a=1, p=5, \{2\}, D_3)$

AUTOMORPHISM GROUP: C_3

FIRST HOMOLOGY: $C_4 \times C_3$

COVERS: $(a=1, p=5, \{2\})$ index 3, regular

CLASS: $(a=1, p=5, \{2I\})$

FPP: $(a=1, p=5, \{2I\})$

AUTOMORPHISM GROUP: trivial

FIRST HOMOLOGY: $C_2 \times C_4 \times C_4 \times C_3$

COVERS: $(a=1, p=5, \emptyset)$ index 3, not regular
 $(a=1, p=5, \{2\})$ index 3, not regular

FIELDS: $(a=2, p=3)$, $\$k=\mathbb{Q}\$, \ell=\mathbb{Q}[\sqrt{-2}]\$$

DETERMINANT: $\det(x)=D(x)$, a power of $(1+2\sqrt{-2})/3$, modulo cubes

CLASS: $(a=2, p=3, \emptyset)$

FPP/3: $(a=2, p=3, \emptyset)$

AUTOMORPHISM GROUP: trivial

ABELIANIZATION: $C_2 \times C_2 \times C_3$

FUNDAMENTAL GROUP: $C_2 \times C_2$

FIRST HOMOLOGY: $C_2 \times C_2$

COVERED BY: $(a=2, p=3, \emptyset, D_3)$ index 3, regular
 $(a=2, p=3, \{2I\})$ index 3, not regular

FPP: $(a=2, p=3, \emptyset, D_3)$

AUTOMORPHISM GROUP: C_3

FIRST HOMOLOGY: $C_2 \times C_2 \times C_3$

COVERS: $(a=2, p=3, \emptyset)$ index 3, regular

CLASS: $(a=2, p=3, \{2\})$

FPP/3: $(a=2, p=3, \{2\})$

AUTOMORPHISM GROUP: trivial

ABELIANIZATION: $C_2 \times C_2 \times C_3$

FUNDAMENTAL GROUP: $C_2 \times C_2$

FIRST HOMOLOGY: $C_2 \times C_2$

COVERED BY: (a=2,p=3,\{2\},D_3) index 3, regular
(a=2,p=3,\{2I\}) index 3, not regular

FPP: (a=2,p=3,\{2\},D_3)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C2 x C2 x C13
COVERS: (a=2,p=3,\{2\}) index 3, regular

CLASS: (a=2,p=3,\{2I\})

FPP: (a=2,p=3,\{2I\})
AUTOMORPHISM GROUP: trivial
FIRST HOMOLOGY: C2 x C2 x C2 x C2 x C3
COVERS: (a=2,p=3,\emptyset) index 3, not regular
(a=2,p=3,\{2\}) index 3, not regular

FIELDS: (a=7,p=2), $\$k=\mathbb{Q}\$, \ell=\mathbb{Q}[\sqrt{-7}]\$$
DETERMINANT: $\det(x)=D(x)$, a power of $(3+\sqrt{-7})/4$, modulo cubes

CLASS: (a=7,p=2,\emptyset)

FPP/21: (a=7,p=2,\emptyset)
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C3
FUNDAMENTAL GROUP: C2
FIRST HOMOLOGY: C2
COVERED BY: (a=7,p=2,\emptyset,D_3) index 3, regular
(a=7,p=2,\emptyset,2_7) index 7, not regular
(a=7,p=2,\emptyset,X_7) index 7, not regular
(a=7,p=2,\emptyset,D_3 2_7) index 21, regular
(a=7,p=2,\emptyset,7_{21}) index 21, not regular
(a=7,p=2,\emptyset,D_3 X_7) index 21, not regular

FPP/7: (a=7,p=2,\emptyset,D_3)
AUTOMORPHISM GROUP: C3
ABELIANIZATION: C2 x C7
FUNDAMENTAL GROUP: C2
FIRST HOMOLOGY: C2
COVERED BY: (a=7,p=2,\emptyset,D_3 2_7) index 7, regular
(a=7,p=2,\emptyset,D_3 X_7) index 7, not regular
COVERS: (a=7,p=2,\emptyset) index 3, regular

FPP/3: (a=7,p=2,\emptyset,2_7)
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C2 x C3
FUNDAMENTAL GROUP: D8
FIRST HOMOLOGY: C2 x C2
COVERED BY: (a=7,p=2,\emptyset,D_3 2_7) index 3, regular
COVERS: (a=7,p=2,\emptyset) index 7, not regular

FPP/3: (a=7,p=2,\emptyset,X_7)
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C3
FUNDAMENTAL GROUP: C2
FIRST HOMOLOGY: C2
COVERED BY: (a=7,p=2,\emptyset,D_3 X_7) index 3, regular
COVERS: (a=7,p=2,\emptyset) index 7, not regular

FPP: (a=7,p=2,\emptyset,D_3 2_7)
AUTOMORPHISM GROUP: C7 : C3
FIRST HOMOLOGY: C2^4
COVERS: (a=7,p=2,\emptyset) index 21, regular
(a=7,p=2,\emptyset,D_3) index 7, regular
(a=7,p=2,\emptyset,2_7) index 3, regular

FPP: (a=7,p=2,\emptyset,7_{21})

AUTOMORPHISM GROUP: trivial
FIRST HOMOLOGY: C2 x C2 x C3 x C7
COVERS: (a=7,p=2,\emptyset) index 21, not regular

FPP: (a=7,p=2,\emptyset,D_3 X_7)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C2 x C7
COVERS: (a=7,p=2,\emptyset) index 21, not regular
(a=7,p=2,\emptyset,D_3) index 7, not regular
(a=7,p=2,\emptyset,X_7) index 3, regular

CLASS: (a=7,p=2,\{7\})

FPP/21: (a=7,p=2,\{7\})
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C3
FUNDAMENTAL GROUP: trivial
FIRST HOMOLOGY: trivial
COVERED BY: (a=7,p=2,\{7\},D_3) index 3, regular
(a=7,p=2,\{7\},2_7) index 7, not regular
(a=7,p=2,\{7\},7_7) index 7, not regular
(a=7,p=2,\{7\},7'_7) index 7, not regular
(a=7,p=2,\{7\},D_3 2_7) index 21, regular
(a=7,p=2,\{7\},D_3 7_7) index 21, not regular
(a=7,p=2,\{7\},D_3 7'_7) index 21, not regular
(a=7,p=2,\{7\},7_{21}) index 21, not regular

FPP/7: (a=7,p=2,\{7\},D_3)
AUTOMORPHISM GROUP: C3
ABELIANIZATION: C7
FUNDAMENTAL GROUP: trivial
FIRST HOMOLOGY: trivial
COVERED BY: (a=7,p=2,\{7\},D_3 2_7) index 7, regular
(a=7,p=2,\{7\},D_3 7_7) index 7, not regular
(a=7,p=2,\{7\},D_3 7'_7) index 7, not regular
COVERS: (a=7,p=2,\{7\}) index 3, regular

FPP/3: (a=7,p=2,\{7\},2_7)
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C3
FUNDAMENTAL GROUP: C2
FIRST HOMOLOGY: C2
COVERED BY: (a=7,p=2,\{7\},D_3 2_7) index 3, regular
COVERS: (a=7,p=2,\{7\}) index 7, not regular

FPP/3: (a=7,p=2,\{7\},7_7)
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C3
FUNDAMENTAL GROUP: C2
FIRST HOMOLOGY: C2
COVERED BY: (a=7,p=2,\{7\},D_3 7_7) index 3, regular
(a=7,p=2,\{7\},7_{21}) index 3, not regular
COVERS: (a=7,p=2,\{7\}) index 7, not regular

FPP/3: (a=7,p=2,\{7\},7'_7)
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C2 x C3
FUNDAMENTAL GROUP: C2 x C2
FIRST HOMOLOGY: C2 x C2
COVERED BY: (a=7,p=2,\{7\},D_3 7'_7) index 3, regular
(a=7,p=2,\{7\},7_{21}) index 3, not regular
COVERS: (a=7,p=2,\{7\}) index 7, not regular

FPP: (a=7,p=2,\{7\},D_3 2_7)
AUTOMORPHISM GROUP: C7 : C3
FIRST HOMOLOGY: C2 x C2 x C2

COVERS: (a=7,p=2,\{7\}) index 21, regular
 (a=7,p=2,\{7\},D_3) index 7, regular
 (a=7,p=2,\{7\},2_7) index 3, regular

FPP: (a=7,p=2,\{7\},D_3 7_7)
 AUTOMORPHISM GROUP: C3
 FIRST HOMOLOGY: C2 x C7
 COVERS: (a=7,p=2,\{7\}) index 21, not regular
 (a=7,p=2,\{7\},D_3) index 7, not regular
 (a=7,p=2,\{7\},7_7) index 3, regular

FPP: (a=7,p=2,\{7\},D_3 7'_7)
 AUTOMORPHISM GROUP: C3
 FIRST HOMOLOGY: C2 x C2 x C7
 COVERS: (a=7,p=2,\{7\}) index 21, not regular
 (a=7,p=2,\{7\},D_3) index 7, not regular
 (a=7,p=2,\{7\},7'_7) index 3, regular

FPP: (a=7,p=2,\{7\},7_{21})
 AUTOMORPHISM GROUP: trivial
 FIRST HOMOLOGY: C2 x C2 x C2 x C3
 COVERS: (a=7,p=2,\{7\}) index 21, not regular
 (a=7,p=2,\{7\},7_7) index 3, not regular
 (a=7,p=2,\{7\},7'_7) index 3, not regular

CLASS: (a=7,p=2,\{3\})

FPP/3: (a=7,p=2,\{3\})
 AUTOMORPHISM GROUP: trivial
 ABELIANIZATION: C2 x C4 x C3
 FUNDAMENTAL GROUP: C2 x C4
 FIRST HOMOLOGY: C2 x C4
 COVERED BY: (a=7,p=2,\{3\},D_3) index 3, regular
 (a=7,p=2,\{3\},3_3) index 3, not regular

FPP: (a=7,p=2,\{3\},D_3)
 AUTOMORPHISM GROUP: C3
 FIRST HOMOLOGY: C2 x C4 x C7
 COVERS: (a=7,p=2,\{3\}) index 3, regular

FPP: (a=7,p=2,\{3\},3_3)
 AUTOMORPHISM GROUP: trivial
 FIRST HOMOLOGY: C2 x C2 x C4 x C3
 COVERS: (a=7,p=2,\{3\}) index 3, not regular

CLASS: (a=7,p=2,\{3,7\})

FPP/3: (a=7,p=2,\{3,7\})
 AUTOMORPHISM GROUP: trivial
 ABELIANIZATION: C3 x C4
 FUNDAMENTAL GROUP: C4
 FIRST HOMOLOGY: C4
 COVERED BY: (a=7,p=2,\{3,7\},D_3) index 3, regular
 (a=7,p=2,\{3,7\},3_3) index 3, not regular

FPP: (a=7,p=2,\{3,7\},D_3)
 AUTOMORPHISM GROUP: C3
 FIRST HOMOLOGY: C4 x C7
 COVERS: (a=7,p=2,\{3,7\}) index 3, regular

FPP: (a=7,p=2,\{3,7\},3_3)
 AUTOMORPHISM GROUP: trivial
 FIRST HOMOLOGY: C2 x C4 x C3
 COVERS: (a=7,p=2,\{3,7\}) index 3, not regular

CLASS: (a=7,p=2,\{5\})

FPP: (a=7,p=2,\{5\})
AUTOMORPHISM GROUP: trivial
FIRST HOMOLOGY: C2 x C2 x C9

CLASS: (a=7,p=2,\{5,7\})

FPP: (a=7,p=2,\{5,7\})
AUTOMORPHISM GROUP: trivial
FIRST HOMOLOGY: C2 x C9

FIELDS: (a=15,p=2), \$k=\mathbb{Q}\$, \$\ell=\mathbb{Q}[\sqrt{-15}]\$
DETERMINANT: \$\det(x)=D(x)\$, a power of \$(1+\sqrt{-15})/4\$, modulo cubes
CLASS: (a=15,p=2,\emptyset)

FPP/3: (a=15,p=2,\emptyset)
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C2 x C3
FUNDAMENTAL GROUP: C2 x C2
FIRST HOMOLOGY: C2 x C2
COVERED BY: (a=15,p=2,\emptyset,D_3) index 3, regular
(a=15,p=2,\emptyset,3_3) index 3, not regular

FPP: (a=15,p=2,\emptyset,D_3)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C2 x C2 x C7
COVERS: (a=15,p=2,\emptyset) index 3, regular

FPP: (a=15,p=2,\emptyset,3_3)
AUTOMORPHISM GROUP: trivial
FIRST HOMOLOGY: C2 x C2 x C2 x C9
COVERS: (a=15,p=2,\emptyset) index 3, not regular

CLASS: (a=15,p=2,\{3\})

FPP/3: (a=15,p=2,\{3\})
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C3 x C3
FUNDAMENTAL GROUP: C2 x C3
FIRST HOMOLOGY: C2 x C3
COVERED BY: (a=15,p=2,\{3\},D_3) index 3, regular
(a=15,p=2,\{3\},3_3) index 3, regular
(a=15,p=2,\{3\},(D3)_3) index 3, regular

FPP: (a=15,p=2,\{3\},D_3)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C2 x C3 x C7
COVERS: (a=15,p=2,\{3\}) index 3, regular

FPP: (a=15,p=2,\{3\},3_3)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C2 x C2 x C2 x C3
COVERS: (a=15,p=2,\{3\}) index 3, regular

FPP: (a=15,p=2,\{3\},(D3)_3)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C2 x C3
COVERS: (a=15,p=2,\{3\}) index 3, regular

CLASS: (a=15,p=2,\{5\})

FPP/3: (a=15,p=2,\{5\})
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C3
FUNDAMENTAL GROUP: C2
FIRST HOMOLOGY: C2

COVERED BY: (a=15,p=2,\{5\},D_3) index 3, regular
(a=15,p=2,\{5\},3_3) index 3, not regular

FPP: (a=15,p=2,\{5\},D_3)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C2 x C7
COVERS: (a=15,p=2,\{5\}) index 3, regular

FPP: (a=15,p=2,\{5\},3_3)
AUTOMORPHISM GROUP: trivial
FIRST HOMOLOGY: C2 x C2 x C9
COVERS: (a=15,p=2,\{5\}) index 3, not regular

CLASS: (a=15,p=2,\{3,5\})

FPP/3: (a=15,p=2,\{3,5\})
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C3 x C3
FUNDAMENTAL GROUP: C3
FIRST HOMOLOGY: C3
COVERED BY: (a=15,p=2,\{3,5\},D_3) index 3, regular
(a=15,p=2,\{3,5\},3_3) index 3, regular
(a=15,p=2,\{3,5\},(D3)_3) index 3, regular

FPP: (a=15,p=2,\{3,5\},D_3)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C3 x C7
COVERS: (a=15,p=2,\{3,5\}) index 3, regular

FPP: (a=15,p=2,\{3,5\},3_3)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C2 x C2 x C3
COVERS: (a=15,p=2,\{3,5\}) index 3, regular

FPP: (a=15,p=2,\{3,5\},(D3)_3)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C3
COVERS: (a=15,p=2,\{3,5\}) index 3, regular

FIELDS: (a=23,p=2), \$k=\mathbb{Q}\sqrt{-23}\$, \$\ell=\mathbb{Q}[\sqrt{-23}]\$
DETERMINANT: \$\det(x)=D(x)\$, a power of \$(7+3\sqrt{-23})/16\$, modulo cubes
CLASS: (a=23,p=2,\emptyset)

FPP: (a=23,p=2,\emptyset)
AUTOMORPHISM GROUP: trivial
FIRST HOMOLOGY: C2 x C3 x C7

CLASS: (a=23,p=2,\{23\})

FPP: (a=23,p=2,\{23\})
AUTOMORPHISM GROUP: trivial
FIRST HOMOLOGY: C3 x C7

FIELDS: (C2,p=2), \$k=\mathbb{Q}[\sqrt{5}]\$, \$\ell=k[\sqrt{-3}]\$
DETERMINANT: \$\det(x)=d(x)D(x)\$ with
\$d(x)\$ a power of \$\zeta_3\$
\$D(x)\$ a power of \$(1+\sqrt{-15})/4\$, modulo cubes

CLASS: (C2,p=2,\emptyset)

FPP/9: (C2,p=2,\emptyset)
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C3 x C3
FUNDAMENTAL GROUP: C2
FIRST HOMOLOGY: C2
NO LIFT TO SU(2,1)

COVERED BY: (C2,p=2,\emptyset,D_3) index 3, regular
(C2,p=2,\emptyset,d_3) index 3, regular
(C2,p=2,\emptyset,(dD)_3) index 3, regular
(C2,p=2,\emptyset,(d^2D)_3) index 3, regular
(C2,p=2,\emptyset,X_3) index 3, not regular

(C2,p=2,\emptyset,d_3 D_3) index 9, regular
(C2,p=2,\emptyset,D_3 X_3) index 9, not regular
(C2,p=2,\emptyset,(dD)_3 X_3) index 9, not regular
(C2,p=2,\emptyset,(d^2D)_3 X_3) index 9, not regular
(C2,p=2,\emptyset,d_3 X'_3) index 9, not regular
(C2,p=2,\emptyset,X_9) index 9, not regular

FPP/3: (C2,p=2,\emptyset,D_3)
AUTOMORPHISM GROUP: C3
ABELIANIZATION: C2 x C3 x C7
FUNDAMENTAL GROUP: C2 x C7
FIRST HOMOLOGY: C2 x C7
LIFTS TO SU(2,1)
COVERED BY: (C2,p=2,\emptyset,d_3 D_3) index 3, regular
(C2,p=2,\emptyset,D_3 X_3) index 3, not regular
COVERS: (C2,p=2,\emptyset) index 3, regular

FPP/3: (C2,p=2,\emptyset,d_3)
AUTOMORPHISM GROUP: C3
ABELIANIZATION: C2 x C3
FUNDAMENTAL GROUP: S3
FIRST HOMOLOGY: C2
LIFTS TO SU(2,1)
COVERED BY: (C2,p=2,\emptyset,d_3 D_3) index 3, regular
(C2,p=2,\emptyset,d_3 X'_3) index 3, not regular
COVERS: (C2,p=2,\emptyset) index 3, regular

FPP/3: (C2,p=2,\emptyset,(dD)_3)
AUTOMORPHISM GROUP: C3
ABELIANIZATION: C2 x C3
FUNDAMENTAL GROUP: C2
FIRST HOMOLOGY: C2
LIFTS TO SU(2,1)
COVERED BY: (C2,p=2,\emptyset,d_3 D_3) index 3, regular
(C2,p=2,\emptyset,(dD)_3 X_3) index 3, not regular
COVERS: (C2,p=2,\emptyset) index 3, regular

FPP/3: (C2,p=2,\emptyset,(d^2D)_3)
AUTOMORPHISM GROUP: C3
ABELIANIZATION: C2 x C3
FUNDAMENTAL GROUP: C2
FIRST HOMOLOGY: C2
LIFTS TO SU(2,1)
COVERED BY: (C2,p=2,\emptyset,d_3 D_3) index 3, regular
(C2,p=2,\emptyset,(d^2D)_3 X_3) index 3, not regular
COVERS: (C2,p=2,\emptyset) index 3, regular

FPP/3: (C2,p=2,\emptyset,X_3)
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C3 x C3
FUNDAMENTAL GROUP: C2 x C3
FIRST HOMOLOGY: C2 x C3
LIFTS TO SU(2,1)
COVERED BY: (C2,p=2,\emptyset,D_3 X_3) index 3, regular
(C2,p=2,\emptyset,(dD)_3 X_3) index 3, regular
(C2,p=2,\emptyset,(d^2D)_3 X_3) index 3, regular
(C2,p=2,\emptyset,X_9) index 3, not regular
COVERS: (C2,p=2,\emptyset) index 3, not regular

FPP: (C2,p=2,\emptyset,d_3 D_3)

AUTOMORPHISM GROUP: $C_3 \times C_3$
 FIRST HOMOLOGY: $C_2 \times C_7$
 LIFTS TO $SU(2,1)$
 COVERS: $(C_2, p=2, \emptyset)$ index 9, regular
 $(C_2, p=2, \emptyset, d_3)$ index 3, regular
 $(C_2, p=2, \emptyset, D_3)$ index 3, regular
 $(C_2, p=2, \emptyset, (dD)_3)$ index 3, regular
 $(C_2, p=2, \emptyset, (d^2D)_3)$ index 3, regular

FPP: $(C_2, p=2, \emptyset, D_3 \times X_3)$
 AUTOMORPHISM GROUP: C_3
 FIRST HOMOLOGY: $C_2 \times C_9 \times C_7$
 LIFTS TO $SU(2,1)$
 COVERS: $(C_2, p=2, \emptyset)$ index 9, not regular
 $(C_2, p=2, \emptyset, D_3)$ index 3, not regular
 $(C_2, p=2, \emptyset, X_3)$ index 3, regular

FPP: $(C_2, p=2, \emptyset, (dD)_3 \times X_3)$
 AUTOMORPHISM GROUP: C_3
 FIRST HOMOLOGY: $C_2 \times C_9$
 LIFTS TO $SU(2,1)$
 COVERS: $(C_2, p=2, \emptyset)$ index 9, not regular
 $(C_2, p=2, \emptyset, (dD)_3)$ index 3, not regular
 $(C_2, p=2, \emptyset, X_3)$ index 3, regular

FPP: $(C_2, p=2, \emptyset, (d^2D)_3 \times X_3)$
 AUTOMORPHISM GROUP: C_3
 FIRST HOMOLOGY: $C_2 \times C_9$
 LIFTS TO $SU(2,1)$
 COVERS: $(C_2, p=2, \emptyset)$ index 9, not regular
 $(C_2, p=2, \emptyset, (d^2D)_3)$ index 3, not regular
 $(C_2, p=2, \emptyset, X_3)$ index 3, regular

FPP: $(C_2, p=2, \emptyset, d_3 \times X'_3)$
 AUTOMORPHISM GROUP: trivial
 FIRST HOMOLOGY: $C_2 \times C_3 \times C_3$
 LIFTS TO $SU(2,1)$
 COVERS: $(C_2, p=2, \emptyset)$ index 9, not regular
 $(C_2, p=2, \emptyset, d_3)$ index 3, not regular

FPP: $(C_2, p=2, \emptyset, X_9)$
 AUTOMORPHISM GROUP: trivial
 FIRST HOMOLOGY: $C_2 \times C_3 \times C_3$
 LIFTS TO $SU(2,1)$
 COVERS: $(C_2, p=2, \emptyset)$ index 9, not regular
 $(C_2, p=2, \emptyset, X_3)$ index 3, not regular

CLASS: $(C_2, p=2, \{3\})$

FPP/9: $(C_2, p=2, \{3\})$
 AUTOMORPHISM GROUP: trivial
 ABELIANIZATION: $C_3 \times C_3$
 FUNDAMENTAL GROUP: trivial
 FIRST HOMOLOGY: trivial
 NO LIFT TO $SU(2,1)$
 COVERED BY: $(C_2, p=2, \{3\}, D_3)$ index 3, regular
 $(C_2, p=2, \{3\}, d_3)$ index 3, regular
 $(C_2, p=2, \{3\}, (dD)_3)$ index 3, regular
 $(C_2, p=2, \{3\}, (d^2D)_3)$ index 3, regular
 $(C_2, p=2, \{3\}, d_3 \times D_3)$ index 9, regular

FPP/3: $(C_2, p=2, \{3\}, D_3)$
 AUTOMORPHISM GROUP: C_3
 ABELIANIZATION: $C_3 \times C_7$
 FUNDAMENTAL GROUP: C_7

FIRST HOMOLOGY: C7
 LIFTS TO SU(2,1)
 COVERED BY: (C2,p=2,\{3\},d_3 D_3) index 3, regular
 COVERS: (C2,p=2,\{3\}) index 3, regular

FPP/3: (C2,p=2,\{3\},d_3)
 AUTOMORPHISM GROUP: C3
 ABELIANIZATION: C3
 FUNDAMENTAL GROUP: trivial
 FIRST HOMOLOGY: trivial
 LIFTS TO SU(2,1)
 COVERED BY: (C2,p=2,\{3\},d_3 D_3) index 3, regular
 COVERS: (C2,p=2,\{3\}) index 3, regular

FPP/3: (C2,p=2,\{3\},(dD)_3)
 AUTOMORPHISM GROUP: C3
 ABELIANIZATION: C3
 FUNDAMENTAL GROUP: trivial
 FIRST HOMOLOGY: trivial
 LIFTS TO SU(2,1)
 COVERED BY: (C2,p=2,\{3\},d_3 D_3) index 3, regular
 COVERS: (C2,p=2,\{3\}) index 3, regular

FPP/3: (C2,p=2,\{3\},(d^2D)_3)
 AUTOMORPHISM GROUP: C3
 ABELIANIZATION: C3
 FUNDAMENTAL GROUP: trivial
 FIRST HOMOLOGY: trivial
 LIFTS TO SU(2,1)
 COVERED BY: (C2,p=2,\{3\},d_3 D_3) index 3, regular
 COVERS: (C2,p=2,\{3\}) index 3, regular

FPP: (C2,p=2,\{3\},d_3 D_3)
 AUTOMORPHISM GROUP: C3 x C3
 FIRST HOMOLOGY: C7
 LIFTS TO SU(2,1)
 COVERS: (C2,p=2,\{3\}) index 9, regular
 (C2,p=2,\{3\},d_3) index 3, regular
 (C2,p=2,\{3\},D_3) index 3, regular
 (C2,p=2,\{3\},(dD)_3) index 3, regular
 (C2,p=2,\{3\},(d^2D)_3) index 3, regular

FIELDS: (C10,p=2), \$k=\mathbb{Q}[\sqrt{2}]\$, \$\ell=k[\sqrt{-5+2\sqrt{2}}]\$
 DETERMINANT: \$\det(x)=D(x)\$, a power of
 \$(1+\sqrt{2})+\sqrt{-5+2\sqrt{2}}/(2\sqrt{2})\$, modulo cubes

CLASS: (C10,p=2,\emptyset)

FPP/3: (C10,p=2,\emptyset)
 AUTOMORPHISM GROUP: trivial
 ABELIANIZATION: C2 x C3
 FUNDAMENTAL GROUP: C2
 FIRST HOMOLOGY: C2
 COVERED BY: (C10,p=2,\emptyset,D_3) index 3, regular

FPP: (C10,p=2,\emptyset,D_3)
 AUTOMORPHISM GROUP: C3
 FIRST HOMOLOGY: C2 x C7
 COVERS: (C10,p=2,\emptyset) index 3, regular

CLASS: (C10,p=2,\{17-\})

FPP/3: (C10,p=2,\{17-\})
 AUTOMORPHISM GROUP: trivial
 ABELIANIZATION: C3
 FUNDAMENTAL GROUP: trivial

FIRST HOMOLOGY: trivial
COVERED BY: $(C_{10}, p=2, \{17-\}, D_3)$ index 3, regular

FPP: $(C_{10}, p=2, \{17-\}, D_3)$
AUTOMORPHISM GROUP: C_3
FIRST HOMOLOGY: C_7
COVERS: $(C_{10}, p=2, \{17-\})$ index 3, regular

FIELDS: $(C_{18}, p=3)$, $\$k=\mathbb{Q}[\sqrt{6}]$, $\$ell=k[\sqrt{-3}]$
DETERMINANT: $\$\det(x)=d(x)D(x)$ with
 $\$d(x)$ a power of $\$\zeta_3$
 $\$D(x)$ a power of $\$(\sqrt{6}+\sqrt{-3})/3$, modulo cubes

CLASS: $(C_{18}, p=3, \emptyset)$

FPP/9: $(C_{18}, p=3, \emptyset)$
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: $C_3 \times C_3$
FUNDAMENTAL GROUP: trivial
FIRST HOMOLOGY: trivial
NO LIFT TO $SU(2, 1)$
COVERED BY: $(C_{18}, p=3, \emptyset, D_3)$ index 3, regular
 $(C_{18}, p=3, \emptyset, d_3)$ index 3, regular
 $(C_{18}, p=3, \emptyset, (dD)_3)$ index 3, regular
 $(C_{18}, p=3, \emptyset, (d^2D)_3)$ index 3, regular
 $(C_{18}, p=3, \emptyset, d_3 D_3)$ index 9, regular
 $(C_{18}, p=3, \{2I\})$ index 9, not regular

FPP/3: $(C_{18}, p=3, \emptyset, D_3)$
AUTOMORPHISM GROUP: C_3
ABELIANIZATION: $C_3 \times C_{13}$
FUNDAMENTAL GROUP: C_{13}
FIRST HOMOLOGY: C_{13}
LIFTS TO $SU(2, 1)$
COVERS: $(C_{18}, p=3, \emptyset)$ index 3, regular
COVERED BY: $(C_{18}, p=3, \emptyset, d_3 D_3)$ index 3, regular

FPP/3: $(C_{18}, p=3, \emptyset, d_3)$
AUTOMORPHISM GROUP: C_3
ABELIANIZATION: $C_2 \times C_2 \times C_3$
FUNDAMENTAL GROUP: Q_8
FIRST HOMOLOGY: $C_2 \times C_2$
LIFTS TO $SU(2, 1)$
COVERS: $(C_{18}, p=3, \emptyset)$ index 3, regular
COVERED BY: $(C_{18}, p=3, \emptyset, d_3 D_3)$ index 3, regular

FPP/3: $(C_{18}, p=3, \emptyset, (dD)_3)$
AUTOMORPHISM GROUP: C_3
ABELIANIZATION: C_3
FUNDAMENTAL GROUP: trivial
FIRST HOMOLOGY: trivial
LIFTS TO $SU(2, 1)$
COVERS: $(C_{18}, p=3, \emptyset)$ index 3, regular
COVERED BY: $(C_{18}, p=3, \emptyset, d_3 D_3)$ index 3, regular

FPP/3: $(C_{18}, p=3, \emptyset, (d^2D)_3)$
AUTOMORPHISM GROUP: C_3
ABELIANIZATION: C_3
FUNDAMENTAL GROUP: trivial
FIRST HOMOLOGY: trivial
LIFTS TO $SU(2, 1)$
COVERS: $(C_{18}, p=3, \emptyset)$ index 3, regular
COVERED BY: $(C_{18}, p=3, \emptyset, d_3 D_3)$ index 3, regular

FPP: $(C_{18}, p=3, \emptyset, d_3 D_3)$
AUTOMORPHISM GROUP: $C_3 \times C_3$

FIRST HOMOLOGY: $C_2 \times C_2 \times C_{13}$
 LIFTS TO $SU(2,1)$
 COVERS: $(C_{18}, p=3, \emptyset)$ index 9, regular
 $(C_{18}, p=3, \emptyset, D_3)$ index 3, regular
 $(C_{18}, p=3, \emptyset, d_3)$ index 3, regular
 $(C_{18}, p=3, \emptyset, (dD)_3)$ index 3, regular
 $(C_{18}, p=3, \emptyset, (d^2D)_3)$ index 3, regular

CLASS: $(C_{18}, p=3, \{2\})$

FPP/3: $(C_{18}, p=3, \{2\})$
 AUTOMORPHISM GROUP: trivial
 ABELIANIZATION: $C_2 \times C_3 \times C_3$
 FUNDAMENTAL GROUP: $C_2 \times C_3$
 FIRST HOMOLOGY: $C_2 \times C_3$
 NO LIFT TO $SU(2,1)$
 COVERED BY: $(C_{18}, p=3, \{2\}, D_3)$ index 3, regular
 $(C_{18}, p=3, \{2\}, (dD)_3)$ index 3, regular
 $(C_{18}, p=3, \{2\}, (d^2D)_3)$ index 3, regular
 $(C_{18}, p=3, \{2I\})$ index 3, not regular

FPP: $(C_{18}, p=3, \{2\}, D_3)$
 AUTOMORPHISM GROUP: C_3
 FIRST HOMOLOGY: $C_2 \times C_3 \times C_{13}$
 NO LIFT TO $SU(2,1)$
 COVERS: $(C_{18}, p=3, \{2\})$ index 3, regular

FPP: $(C_{18}, p=3, \{2\}, (dD)_3)$
 AUTOMORPHISM GROUP: C_3
 FIRST HOMOLOGY: $C_2 \times C_3$
 NO LIFT TO $SU(2,1)$
 COVERS: $(C_{18}, p=3, \{2\})$ index 3, regular

FPP: $(C_{18}, p=3, \{2\}, (d^2D)_3)$
 AUTOMORPHISM GROUP: C_3
 FIRST HOMOLOGY: $C_2 \times C_3$
 NO LIFT TO $SU(2,1)$
 COVERS: $(C_{18}, p=3, \{2\})$ index 3, regular

CLASS: $(C_{18}, p=3, \{2I\})$

FPP: $(C_{18}, p=3, \{2I\})$
 AUTOMORPHISM GROUP: trivial
 FIRST HOMOLOGY: $C_2 \times C_3 \times C_3$
 NO LIFT TO $SU(2,1)$
 COVERS: $(C_{18}, p=3, \emptyset)$ index 9, not regular
 $(C_{18}, p=3, \{2\})$ index 3, not regular

FIELDS: $(C_{20}, p=2)$, $\$k=\mathbb{Q}[\sqrt{7}]$, $\$ell=k[i]$
 DETERMINANT: $\$\det(x)=D(x)$, a power of $\$(3+\sqrt{-7})/4$, modulo
 cubes

CLASS: $(C_{20}, p=2, \emptyset)$

FPP/21: $(C_{20}, p=2, \emptyset)$
 AUTOMORPHISM GROUP: trivial
 ABELIANIZATION: C_3
 FUNDAMENTAL GROUP: trivial
 FIRST HOMOLOGY: trivial
 COVERED BY: $(C_{20}, p=2, \emptyset, D_3)$ index 3, regular
 $(C_{20}, p=2, \emptyset, 2_7)$ index 7, not regular
 $(C_{20}, p=2, \emptyset, D_3 2_7)$ index 21, regular

FPP/7: $(C_{20}, p=2, \emptyset, D_3)$
 AUTOMORPHISM GROUP: C_3
 ABELIANIZATION: C_7

FUNDAMENTAL GROUP: trivial
FIRST HOMOLOGY: trivial
COVERED BY: (C20,p=2,\emptyset,D_3 2_7) index 7, regular
COVERS: (C20,p=2,\emptyset) index 3, regular

FPP/3: (C20,p=2,\emptyset,2_7)
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C2 x C2 x C3
FUNDAMENTAL GROUP: C2 x C2
FIRST HOMOLOGY: C2 x C2
COVERED BY: (C20,p=2,\emptyset,D_3 2_7) index 3, regular
COVERS: (C20,p=2,\emptyset) index 7, not regular

FPP: (C20,p=2,\emptyset,D_3 2_7)
AUTOMORPHISM GROUP: C7 : C3
FIRST HOMOLOGY: C2^6
COVERS: (C20,p=2,\emptyset) index 21, regular
(C20,p=2,\emptyset,D_3) index 7, regular
(C20,p=2,\emptyset,2_7) index 3, regular

CLASS: (C20,p=2,\{3+\})

FPP/3: (C20,p=2,\{3+\})
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C4 x C3
FUNDAMENTAL GROUP: C4
FIRST HOMOLOGY: C4
COVERED BY: (C20,p=2,\{3+\},D_3) index 3, regular
(C20,p=2,\{3+\},\{3+\}_3) index 3, not regular

FPP: (C20,p=2,\{3+\},D_3)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C4 x C7
COVERS: (C20,p=2,\{3+\}) index 3, regular

FPP: (C20,p=2,\{3+\},\{3+\}_3)
AUTOMORPHISM GROUP: trivial
FIRST HOMOLOGY: C2 x C4 x C3
COVERS: (C20,p=2,\{3+\}) index 3, not regular

CLASS: (C20,p=2,\{3-\})

FPP/3: (C20,p=2,\{3-\})
AUTOMORPHISM GROUP: trivial
ABELIANIZATION: C4 x C3
FUNDAMENTAL GROUP: C4
FIRST HOMOLOGY: C4
COVERED BY: (C20,p=2,\{3-\},D_3) index 3, regular
(C20,p=2,\{3-\},\{3-\}_3) index 3, not regular

FPP: (C20,p=2,\{3-\},D_3)
AUTOMORPHISM GROUP: C3
FIRST HOMOLOGY: C4 x C7
COVERS: (C20,p=2,\{3-\}) index 3, regular

FPP: (C20,p=2,\{3-\},\{3-\}_3)
AUTOMORPHISM GROUP: trivial
FIRST HOMOLOGY: C2 x C4 x C3
COVERS: (C20,p=2,\{3-\}) index 3, not regular