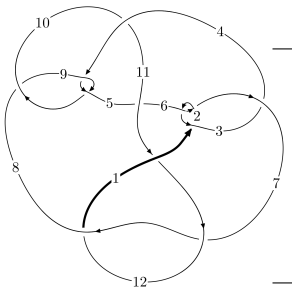
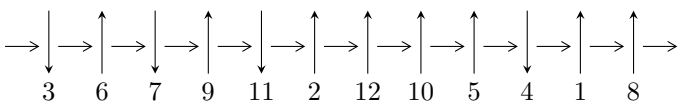
$\underline{12a_{0225}\ (K12a_{0225})}$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$\underset{c_4}{4,9} \xrightarrow{} \underset{c_9}{5} \xrightarrow{} \underset{c_{10}}{10} \xrightarrow{} \underset{c_5}{11} \xrightarrow{} \underset{c_8}{6} \xrightarrow{} \underset{c_{12}}{8,12} \xrightarrow{} \underset{c_7}{1} \xrightarrow{} \underset{c_3}{7} \xrightarrow{} \underset{c_2}{3} \xrightarrow{} 2 \twoheadrightarrow c_1, c_6, c_{11}$$

Ideals for irreducible components[2]of $X_{\mathbf{par}}$

$I_1^u = \langle 4.07777 \times 10^{66} u^{126} + 2.16707 \times 10^{66} u^{125} + \cdots + 1.72852 \times 10^{66} b - 4.32805 \times 10^{66},$
$7.32061 \times 10^{65} u^{126} - 1.66742 \times 10^{66} u^{125} + \cdots + 1.72852 \times 10^{66} a - 1.52406 \times 10^{67},\ u^{127} + u^{126} + \cdots - 4u -$

$I_2^u = \langle u^2 a - u^3 + 2b + u,\ -6u^3 a + 2u^2 a + 2a^2 + 5u^2 - 4a + 6u - 14,\ u^4 - 2u^2 + 2 \rangle$

$I_1^v = \langle a,\ b - v + 1,\ v^2 - v + 1 \rangle$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 137 representations.

[1]The image of knot diagram is generated by the software "**Draw programme**" developed by Andrew Bartholomew(`http://www.layer8.co.uk/maths/draw/index.htm#Running-draw`), where we modified some parts for our purpose(`https://github.com/CATsTAILs/LinksPainter`).

[2]All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

I. $\boldsymbol{I_1^u = \langle 4.08 \times 10^{66} u^{126} + 2.17 \times 10^{66} u^{125} + \cdots + 1.73 \times 10^{66} b - 4.33 \times 10^{66},\ 7.32 \times 10^{65} u^{126} - 1.67 \times 10^{66} u^{125} + \cdots + 1.73 \times 10^{66} a - 1.52 \times 10^{67},\ u^{127} + u^{126} + \cdots - 4u - 4 \rangle}$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^3 \\ -u^3 + u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^8 - u^6 + u^4 + 1 \\ -u^8 + 2u^6 - 2u^4 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^3 \\ u^5 - u^3 + u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -0.423519u^{126} + 0.964650u^{125} + \cdots + 9.44857u + 8.81712 \\ -2.35911u^{126} - 1.25371u^{125} + \cdots + 6.16306u + 2.50390 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -0.00503774u^{126} + 0.683855u^{125} + \cdots + 7.43488u + 5.05619 \\ -1.38708u^{126} - 0.530217u^{125} + \cdots + 5.40266u + 1.20161 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.189021u^{126} - 0.0433393u^{125} + \cdots - 5.68886u - 0.558061 \\ -0.137798u^{126} + 0.166256u^{125} + \cdots + 3.26326u - 0.549191 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -0.406855u^{126} + 0.266501u^{125} + \cdots + 5.53868u + 7.25484 \\ -3.21774u^{126} - 1.72302u^{125} + \cdots + 6.64167u + 4.67939 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.202280u^{126} - 0.184206u^{125} + \cdots + 3.16129u + 3.06932 \\ -2.22568u^{126} - 1.02528u^{125} + \cdots + 5.29101u + 3.62099 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 2.57051u^{126} + 2.63831u^{125} + \cdots + 11.3436u + 1.19661$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{127} + 62u^{126} + \cdots - 34u - 25$
c_2, c_6	$u^{127} - 2u^{126} + \cdots + 24u - 5$
c_3	$u^{127} + 2u^{126} + \cdots - 4532584u - 667745$
c_4, c_9	$u^{127} + u^{126} + \cdots - 4u - 4$
c_5	$u^{127} - u^{126} + \cdots - 7705060u - 2511892$
c_7, c_{12}	$u^{127} - 3u^{126} + \cdots + 11u - 1$
c_8	$u^{127} - 61u^{126} + \cdots + 80u - 16$
c_{10}	$u^{127} + 3u^{126} + \cdots + 54716u - 9292$
c_{11}	$u^{127} - 63u^{126} + \cdots - 9u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{127} + 14y^{126} + \cdots + 23706y - 625$
c_2, c_6	$y^{127} + 62y^{126} + \cdots - 34y - 25$
c_3	$y^{127} - 34y^{126} + \cdots + 8331046653166y - 445883385025$
c_4, c_9	$y^{127} - 61y^{126} + \cdots + 80y - 16$
c_5	$y^{127} - 29y^{126} + \cdots + 382290475250896y - 6309601419664$
c_7, c_{12}	$y^{127} - 63y^{126} + \cdots - 9y - 1$
c_8	$y^{127} + 15y^{126} + \cdots - 5888y - 256$
c_{10}	$y^{127} + 31y^{126} + \cdots - 5880391024y - 86341264$
c_{11}	$y^{127} + 17y^{126} + \cdots - 473y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.655892+0.693362I$ $a=\ \ 1.314510+0.510372I$ $b=\ \ 1.08376+1.72394I$	$-4.37389-10.57070I$	0
$u=-0.655892-0.693362I$ $a=\ \ 1.314510-0.510372I$ $b=\ \ 1.08376-1.72394I$	$-4.37389+10.57070I$	0
$u=-1.047020+0.069569I$ $a=-0.051726+0.443444I$ $b=-0.550463+0.034451I$	$-1.72547-2.55576I$	0
$u=-1.047020-0.069569I$ $a=-0.051726-0.443444I$ $b=-0.550463-0.034451I$	$-1.72547+2.55576I$	0
$u=\ \ 0.634680+0.668715I$ $a=-1.136010+0.469975I$ $b=-0.91228+1.61811I$	$-1.74528+5.54287I$	0
$u=\ \ 0.634680-0.668715I$ $a=-1.136010-0.469975I$ $b=-0.91228-1.61811I$	$-1.74528-5.54287I$	0
$u=-0.592109+0.702459I$ $a=\ \ 1.158410+0.186330I$ $b=\ \ 1.01589+1.27934I$	$-6.26975-2.25990I$	0
$u=-0.592109-0.702459I$ $a=\ \ 1.158410-0.186330I$ $b=\ \ 1.01589-1.27934I$	$-6.26975+2.25990I$	0
$u=\ \ 0.594900+0.697956I$ $a=-0.419012+0.778242I$ $b=\ \ 0.308147+0.247704I$	$-6.21986+4.89035I$	0
$u=\ \ 0.594900-0.697956I$ $a=-0.419012-0.778242I$ $b=\ \ 0.308147-0.247704I$	$-6.21986-4.89035I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.001370 + 0.414476I$ $a = 0.66137 + 1.98187I$ $b = -0.297044 - 0.197706I$	$2.70969 + 4.19118I$	0
$u = 1.001370 - 0.414476I$ $a = 0.66137 - 1.98187I$ $b = -0.297044 + 0.197706I$	$2.70969 - 4.19118I$	0
$u = 1.072370 + 0.217558I$ $a = 0.464726 + 0.287632I$ $b = 0.1216410 + 0.0127233I$	$2.07695 - 0.23674I$	0
$u = 1.072370 - 0.217558I$ $a = 0.464726 - 0.287632I$ $b = 0.1216410 - 0.0127233I$	$2.07695 + 0.23674I$	0
$u = 1.065100 + 0.279580I$ $a = 1.41979 + 1.74741I$ $b = -1.55858 - 1.11538I$	$4.67472 - 1.72073I$	0
$u = 1.065100 - 0.279580I$ $a = 1.41979 - 1.74741I$ $b = -1.55858 + 1.11538I$	$4.67472 + 1.72073I$	0
$u = 0.938234 + 0.584174I$ $a = 1.43618 - 1.11948I$ $b = -0.79409 - 1.30755I$	$-0.848878 - 0.677204I$	0
$u = 0.938234 - 0.584174I$ $a = 1.43618 + 1.11948I$ $b = -0.79409 + 1.30755I$	$-0.848878 + 0.677204I$	0
$u = 0.522467 + 0.724113I$ $a = -0.668044 + 0.645481I$ $b = -0.1164460 - 0.0318385I$	$-7.09599 - 3.42822I$	0
$u = 0.522467 - 0.724113I$ $a = -0.668044 - 0.645481I$ $b = -0.1164460 + 0.0318385I$	$-7.09599 + 3.42822I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.067000 + 0.297601I$ $a = 0.81276 - 3.46883I$ $b = -1.01802 + 1.65962I$	$4.82423 + 2.64205I$	0
$u = 1.067000 - 0.297601I$ $a = 0.81276 + 3.46883I$ $b = -1.01802 - 1.65962I$	$4.82423 - 2.64205I$	0
$u = -0.924048 + 0.616765I$ $a = -1.38793 - 1.36500I$ $b = 0.86619 - 1.49707I$	$-3.57918 + 5.53649I$	0
$u = -0.924048 - 0.616765I$ $a = -1.38793 + 1.36500I$ $b = 0.86619 + 1.49707I$	$-3.57918 - 5.53649I$	0
$u = -0.779035 + 0.415744I$ $a = -0.077329 + 0.485124I$ $b = -0.580693 - 0.119824I$	$-1.31566 - 1.85053I$	0
$u = -0.779035 - 0.415744I$ $a = -0.077329 - 0.485124I$ $b = -0.580693 + 0.119824I$	$-1.31566 + 1.85053I$	0
$u = -1.092840 + 0.268150I$ $a = -0.06360 - 3.32675I$ $b = 0.41687 + 1.99039I$	$5.88768 + 2.49783I$	0
$u = -1.092840 - 0.268150I$ $a = -0.06360 + 3.32675I$ $b = 0.41687 - 1.99039I$	$5.88768 - 2.49783I$	0
$u = -0.339339 + 0.800350I$ $a = 1.095760 - 0.061560I$ $b = 1.34841 - 2.14040I$	$-2.69050 + 13.09910I$	0
$u = -0.339339 - 0.800350I$ $a = 1.095760 + 0.061560I$ $b = 1.34841 + 2.14040I$	$-2.69050 - 13.09910I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.073940 + 0.356945I$ $a = 0.693583 + 0.828577I$ $b = 0.123195 - 0.578978I$	$3.23724 + 1.23193I$	0
$u = 1.073940 - 0.356945I$ $a = 0.693583 - 0.828577I$ $b = 0.123195 + 0.578978I$	$3.23724 - 1.23193I$	0
$u = 1.118950 + 0.174031I$ $a = -0.74468 - 2.11605I$ $b = 0.84591 + 1.47100I$	$-0.31356 - 2.38535I$	0
$u = 1.118950 - 0.174031I$ $a = -0.74468 + 2.11605I$ $b = 0.84591 - 1.47100I$	$-0.31356 + 2.38535I$	0
$u = -0.551054 + 0.669205I$ $a = 0.458769 + 0.611592I$ $b = -0.283645 - 0.016918I$	$-3.25053 - 0.33817I$	0
$u = -0.551054 - 0.669205I$ $a = 0.458769 - 0.611592I$ $b = -0.283645 + 0.016918I$	$-3.25053 + 0.33817I$	0
$u = 0.436742 + 0.748516I$ $a = -0.690511 - 0.365304I$ $b = -0.375553 + 0.221479I$	$-6.66752 + 0.81220I$	0
$u = 0.436742 - 0.748516I$ $a = -0.690511 + 0.365304I$ $b = -0.375553 - 0.221479I$	$-6.66752 - 0.81220I$	0
$u = -1.118640 + 0.183032I$ $a = -0.394837 + 0.057370I$ $b = -0.099667 + 0.275327I$	$-0.26843 + 4.93831I$	0
$u = -1.118640 - 0.183032I$ $a = -0.394837 - 0.057370I$ $b = -0.099667 - 0.275327I$	$-0.26843 - 4.93831I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.380278+0.777084I$ $a=1.017260+0.138781I$ $b=1.00049-1.50794I$	$-5.16483+4.82923I$	0
$u=-0.380278-0.777084I$ $a=1.017260-0.138781I$ $b=1.00049+1.50794I$	$-5.16483-4.82923I$	0
$u=0.374985+0.775788I$ $a=-0.469058-0.484153I$ $b=0.0369528-0.0699892I$	$-5.07821-7.41786I$	0
$u=0.374985-0.775788I$ $a=-0.469058+0.484153I$ $b=0.0369528+0.0699892I$	$-5.07821+7.41786I$	0
$u=-1.095530+0.317267I$ $a=-1.35010+2.04037I$ $b=1.10692-1.44630I$	$6.35011-2.92708I$	0
$u=-1.095530-0.317267I$ $a=-1.35010-2.04037I$ $b=1.10692+1.44630I$	$6.35011+2.92708I$	0
$u=1.028870+0.503372I$ $a=1.89786+0.40949I$ $b=-0.50476-1.44118I$	$2.19843+0.73185I$	0
$u=1.028870-0.503372I$ $a=1.89786-0.40949I$ $b=-0.50476+1.44118I$	$2.19843-0.73185I$	0
$u=0.341008+0.780195I$ $a=-1.007820-0.033895I$ $b=-1.03417-2.09665I$	$-0.23646-7.86331I$	$4.00000+4.73656I$
$u=0.341008-0.780195I$ $a=-1.007820+0.033895I$ $b=-1.03417+2.09665I$	$-0.23646+7.86331I$	$4.00000-4.73656I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.978936 + 0.603644I$ $a = -0.102279 - 0.120716I$ $b = 0.457141 - 0.368803I$	$-5.08445 + 0.11410I$	0
$u = 0.978936 - 0.603644I$ $a = -0.102279 + 0.120716I$ $b = 0.457141 + 0.368803I$	$-5.08445 - 0.11410I$	0
$u = -0.981498 + 0.605801I$ $a = -1.01938 - 1.02209I$ $b = 0.98919 - 1.13852I$	$-5.11812 - 2.76345I$	0
$u = -0.981498 - 0.605801I$ $a = -1.01938 + 1.02209I$ $b = 0.98919 + 1.13852I$	$-5.11812 + 2.76345I$	0
$u = -1.007530 + 0.577065I$ $a = 0.552583 - 0.119569I$ $b = -0.441940 - 0.101137I$	$-1.90343 - 4.50154I$	0
$u = -1.007530 - 0.577065I$ $a = 0.552583 + 0.119569I$ $b = -0.441940 + 0.101137I$	$-1.90343 + 4.50154I$	0
$u = -1.073660 + 0.444900I$ $a = -0.50889 + 1.45609I$ $b = -0.520955 - 0.961785I$	$2.41666 - 5.68494I$	0
$u = -1.073660 - 0.444900I$ $a = -0.50889 - 1.45609I$ $b = -0.520955 + 0.961785I$	$2.41666 + 5.68494I$	0
$u = -1.144340 + 0.219800I$ $a = 1.02599 - 2.80930I$ $b = -0.73122 + 2.21113I$	$4.46493 + 5.09634I$	0
$u = -1.144340 - 0.219800I$ $a = 1.02599 + 2.80930I$ $b = -0.73122 - 2.21113I$	$4.46493 - 5.09634I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.379009+0.738997I$ $a=\ \ 0.485722-0.361571I$ $b=-0.024435+0.180978I$	$-2.40706+2.55125I$	$1.111011-0.764217I$
$u=-0.379009-0.738997I$ $a=\ \ 0.485722+0.361571I$ $b=-0.024435-0.180978I$	$-2.40706-2.55125I$	$1.111011+0.764217I$
$u=-1.045400+0.531152I$ $a=-0.48217+2.74765I$ $b=-1.210830-0.115292I$	$1.73485-1.96309I$	0
$u=-1.045400-0.531152I$ $a=-0.48217-2.74765I$ $b=-1.210830+0.115292I$	$1.73485+1.96309I$	0
$u=\ \ 1.164820+0.211735I$ $a=-1.36701-2.70402I$ $b=\ \ 1.09385+2.31525I$	$2.14759-10.24030I$	0
$u=\ \ 1.164820-0.211735I$ $a=-1.36701+2.70402I$ $b=\ \ 1.09385-2.31525I$	$2.14759+10.24030I$	0
$u=-1.069030+0.511554I$ $a=-0.989284+0.998987I$ $b=-0.034858-1.174900I$	$2.25602-5.77634I$	0
$u=-1.069030-0.511554I$ $a=-0.989284-0.998987I$ $b=-0.034858+1.174900I$	$2.25602+5.77634I$	0
$u=\ \ 1.032330+0.604329I$ $a=-0.526615-0.693515I$ $b=\ \ 0.0453003-0.0801337I$	$-5.58962+8.50219I$	0
$u=\ \ 1.032330-0.604329I$ $a=-0.526615+0.693515I$ $b=\ \ 0.0453003+0.0801337I$	$-5.58962-8.50219I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.148850+0.361119I$ $a=-1.20539+2.45569I$ $b=\ 0.39797-2.03492I$	$6.10363-4.57828I$	0
$u=-1.148850-0.361119I$ $a=-1.20539-2.45569I$ $b=\ 0.39797+2.03492I$	$6.10363+4.57828I$	0
$u=\ 0.548473+0.560041I$ $a=-0.581186+0.351504I$ $b=-0.22696+1.62569I$	$0.75526+3.53954I$	$2.18149-7.44702I$
$u=\ 0.548473-0.560041I$ $a=-0.581186-0.351504I$ $b=-0.22696-1.62569I$	$0.75526-3.53954I$	$2.18149+7.44702I$
$u=\ 0.336858+0.705301I$ $a=-0.727968+0.008197I$ $b=\ 0.05618-2.03611I$	$1.72929-5.09594I$	$4.50177+6.41579I$
$u=\ 0.336858-0.705301I$ $a=-0.727968-0.008197I$ $b=\ 0.05618+2.03611I$	$1.72929+5.09594I$	$4.50177-6.41579I$
$u=-1.096330+0.544084I$ $a=\ 3.14009-0.94983I$ $b=-0.70129+1.90152I$	$3.13491-4.52494I$	0
$u=-1.096330-0.544084I$ $a=\ 3.14009+0.94983I$ $b=-0.70129-1.90152I$	$3.13491+4.52494I$	0
$u=\ 1.105780+0.526642I$ $a=\ 1.01949+2.90721I$ $b=\ 1.46293-1.04888I$	$4.93192+4.48056I$	0
$u=\ 1.105780-0.526642I$ $a=\ 1.01949-2.90721I$ $b=\ 1.46293+1.04888I$	$4.93192-4.48056I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.151020 + 0.425079I$ $a = 0.78313 + 2.34689I$ $b = 0.40099 - 1.68007I$	$2.62164 + 2.63644I$	0
$u = 1.151020 - 0.425079I$ $a = 0.78313 - 2.34689I$ $b = 0.40099 + 1.68007I$	$2.62164 - 2.63644I$	0
$u = -1.144610 + 0.442128I$ $a = -1.27381 + 1.82051I$ $b = -0.25604 - 1.47655I$	$2.51187 - 5.44029I$	0
$u = -1.144610 - 0.442128I$ $a = -1.27381 - 1.82051I$ $b = -0.25604 + 1.47655I$	$2.51187 + 5.44029I$	0
$u = -0.361548 + 0.682305I$ $a = -1.83457 - 0.39466I$ $b = -1.69471 + 0.68902I$	$0.67795 + 4.12128I$	$1.69824 - 4.80167I$
$u = -0.361548 - 0.682305I$ $a = -1.83457 + 0.39466I$ $b = -1.69471 - 0.68902I$	$0.67795 - 4.12128I$	$1.69824 + 4.80167I$
$u = -1.098060 + 0.552571I$ $a = -0.85856 + 3.15191I$ $b = -1.88171 - 0.79380I$	$2.81252 - 8.89904I$	0
$u = -1.098060 - 0.552571I$ $a = -0.85856 - 3.15191I$ $b = -1.88171 + 0.79380I$	$2.81252 + 8.89904I$	0
$u = 1.174090 + 0.371824I$ $a = 1.13122 + 2.65591I$ $b = -0.11533 - 2.34747I$	$4.12793 + 9.21027I$	0
$u = 1.174090 - 0.371824I$ $a = 1.13122 - 2.65591I$ $b = -0.11533 + 2.34747I$	$4.12793 - 9.21027I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.488163+0.591831I$ $a=-2.04232-0.83927I$ $b=-1.326360-0.239711I$	$0.08170-2.52372I$	$-0.58545+4.26188I$
$u=-0.488163-0.591831I$ $a=-2.04232+0.83927I$ $b=-1.326360+0.239711I$	$0.08170+2.52372I$	$-0.58545-4.26188I$
$u=1.084050+0.590895I$ $a=-0.0089860-0.0249450I$ $b=-0.458796-0.290974I$	$-4.75361+4.27265I$	0
$u=1.084050-0.590895I$ $a=-0.0089860+0.0249450I$ $b=-0.458796+0.290974I$	$-4.75361-4.27265I$	0
$u=1.109410+0.553706I$ $a=-3.03682-1.73830I$ $b=0.09113+2.21326I$	$3.96786+9.92336I$	0
$u=1.109410-0.553706I$ $a=-3.03682+1.73830I$ $b=0.09113-2.21326I$	$3.96786-9.92336I$	0
$u=-0.117052+0.750778I$ $a=-0.737414+0.053249I$ $b=-0.31228+1.89008I$	$0.31311-5.40989I$	$2.36073+6.41671I$
$u=-0.117052-0.750778I$ $a=-0.737414-0.053249I$ $b=-0.31228-1.89008I$	$0.31311+5.40989I$	$2.36073-6.41671I$
$u=1.141040+0.496267I$ $a=1.42646+2.59104I$ $b=0.98282-1.66344I$	$5.19001+3.42902I$	0
$u=1.141040-0.496267I$ $a=1.42646-2.59104I$ $b=0.98282+1.66344I$	$5.19001-3.42902I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.105750+0.573417I$ $a=\ 0.137679+0.419713I$ $b=\ 0.063170-0.253101I$	$-0.27192-7.54326I$	0
$u=-1.105750-0.573417I$ $a=\ 0.137679-0.419713I$ $b=\ 0.063170+0.253101I$	$-0.27192+7.54326I$	0
$u=\ 0.754116$ $a=\ 0.825854$ $b=\ 0.314311$	1.13040	9.07550
$u=-0.349393+0.659519I$ $a=\ 0.600807+0.066067I$ $b=-0.63424-1.72068I$	$0.985822-0.166582I$	$2.39777-1.42911I$
$u=-0.349393-0.659519I$ $a=\ 0.600807-0.066067I$ $b=-0.63424+1.72068I$	$0.985822+0.166582I$	$2.39777+1.42911I$
$u=-1.115030+0.587093I$ $a=\ 1.88328-2.36949I$ $b=\ 0.99585+1.59024I$	$-2.99180-9.96544I$	0
$u=-1.115030-0.587093I$ $a=\ 1.88328+2.36949I$ $b=\ 0.99585-1.59024I$	$-2.99180+9.96544I$	0
$u=\ 1.116770+0.584980I$ $a=-0.402630+0.369336I$ $b=-0.0457545-0.0068386I$	$-2.88540+12.54230I$	0
$u=\ 1.116770-0.584980I$ $a=-0.402630-0.369336I$ $b=-0.0457545+0.0068386I$	$-2.88540-12.54230I$	0
$u=-1.164320+0.486707I$ $a=-1.71758+2.42899I$ $b=-0.73763-2.01383I$	$3.34857+0.86730I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.164320-0.486707I$ $a=-1.71758-2.42899I$ $b=-0.73763+2.01383I$	$3.34857-0.86730I$	0
$u=\ 0.614855+0.401071I$ $a=\ 1.91212-1.04537I$ $b=\ 0.440779-0.377899I$	$1.53140-0.74058I$	$3.74515-2.34440I$
$u=\ 0.614855-0.401071I$ $a=\ 1.91212+1.04537I$ $b=\ 0.440779+0.377899I$	$1.53140+0.74058I$	$3.74515+2.34440I$
$u=\ 1.129590+0.576340I$ $a=-2.36365-2.78458I$ $b=-1.11075+2.23670I$	$2.09039+12.95930I$	0
$u=\ 1.129590-0.576340I$ $a=-2.36365+2.78458I$ $b=-1.11075-2.23670I$	$2.09039-12.95930I$	0
$u=-1.136580+0.582078I$ $a=\ 2.19581-3.06172I$ $b=\ 1.45759+2.24892I$	$-0.3278-18.2674I$	0
$u=-1.136580-0.582078I$ $a=\ 2.19581+3.06172I$ $b=\ 1.45759-2.24892I$	$-0.3278+18.2674I$	0
$u=-0.465434+0.541208I$ $a=\ 0.432078+0.182590I$ $b=-0.33838+1.37788I$	$0.43543+1.49452I$	$-0.137410+0.422109I$
$u=-0.465434-0.541208I$ $a=\ 0.432078-0.182590I$ $b=-0.33838-1.37788I$	$0.43543-1.49452I$	$-0.137410-0.422109I$
$u=\ 0.148712+0.696621I$ $a=\ 0.889152-0.195413I$ $b=\ 0.54825+1.52268I$	$2.39138+1.04019I$	$6.89517-1.91377I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.148712 - 0.696621I$ $a = 0.889152 + 0.195413I$ $b = 0.54825 - 1.52268I$	$2.39138 - 1.04019I$	$6.89517 + 1.91377I$
$u = 0.278659 + 0.645657I$ $a = 1.46759 - 0.46420I$ $b = 1.15484 + 0.94905I$	$2.60462 + 0.08121I$	$6.61280 + 0.64113I$
$u = 0.278659 - 0.645657I$ $a = 1.46759 + 0.46420I$ $b = 1.15484 - 0.94905I$	$2.60462 - 0.08121I$	$6.61280 - 0.64113I$
$u = -0.010679 + 0.697595I$ $a = -0.330791 - 0.161147I$ $b = 0.207698 + 1.339730I$	$-0.68317 + 1.36679I$	$-0.201662 - 0.614999I$
$u = -0.010679 - 0.697595I$ $a = -0.330791 + 0.161147I$ $b = 0.207698 - 1.339730I$	$-0.68317 - 1.36679I$	$-0.201662 + 0.614999I$
$u = -0.185011 + 0.556332I$ $a = 0.150859 - 0.107616I$ $b = -0.347326 + 0.610817I$	$0.01599 + 1.73819I$	$0.64899 - 4.14521I$
$u = -0.185011 - 0.556332I$ $a = 0.150859 + 0.107616I$ $b = -0.347326 - 0.610817I$	$0.01599 - 1.73819I$	$0.64899 + 4.14521I$

II.

$\boldsymbol{I_2^u = \langle u^2a-u^3+2b+u,\ -6u^3a+2u^2a+2a^2+5u^2-4a+6u-14,\ u^4-2u^2+2\rangle}$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u \\ -u^3+u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^3 \\ -u^3+u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^3 \\ u^3-u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} a \\ -\frac{1}{2}u^2a+\frac{1}{2}u^3-\frac{1}{2}u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^3+a \\ -\frac{1}{2}u^2a+\frac{3}{2}u^3-\frac{3}{2}u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u^3+a \\ -\frac{1}{2}u^2a+\frac{3}{2}u^3-\frac{3}{2}u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} \frac{1}{2}u^3a-\frac{3}{2}u^3+\cdots+a+\frac{1}{2} \\ -\frac{1}{2}u^2a+\frac{3}{2}u^3-\frac{3}{2}u+1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{2}u^3a-3u^3+\cdots+a-\frac{1}{2} \\ -\frac{1}{2}u^2a+\frac{3}{2}u^3-\frac{3}{2}u+1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 2u^2a-6u^3-4u^2+6u+12$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u^2-u+1)^4$
c_3, c_6	$(u^2+u+1)^4$
c_4, c_9	$(u^4-2u^2+2)^2$
c_5, c_{10}	$(u^4+2u^2+2)^2$
c_7	$(u-1)^8$
c_8	$(u^2+2u+2)^4$
c_{11}, c_{12}	$(u+1)^8$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_6	$(y^2+y+1)^4$
c_4, c_9	$(y^2-2y+2)^4$
c_5, c_{10}	$(y^2+2y+2)^4$
c_7, c_{11}, c_{12}	$(y-1)^8$
c_8	$(y^2+4)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.098680 + 0.455090I$ $a = 0.599366 + 0.964636I$ $b = -0.044910 - 0.232659I$	$4.11234 + 5.69375I$	$10.0000 - 7.46410I$
$u = 1.098680 + 0.455090I$ $a = 2.33142 + 2.69669I$ $b = -0.04491 - 1.96471I$	$4.11234 + 1.63398I$	$10.0000 - 0.53590I$
$u = 1.098680 - 0.455090I$ $a = 0.599366 - 0.964636I$ $b = -0.044910 + 0.232659I$	$4.11234 - 5.69375I$	$10.0000 + 7.46410I$
$u = 1.098680 - 0.455090I$ $a = 2.33142 - 2.69669I$ $b = -0.04491 + 1.96471I$	$4.11234 - 1.63398I$	$10.0000 + 0.53590I$
$u = -1.098680 + 0.455090I$ $a = 0.40063 + 1.96464I$ $b = -0.955090 - 0.232659I$	$4.11234 - 1.63398I$	$10.00000 + 0.53590I$
$u = -1.098680 + 0.455090I$ $a = -1.33142 + 3.69669I$ $b = -0.95509 - 1.96471I$	$4.11234 - 5.69375I$	$10.00000 + 7.46410I$
$u = -1.098680 - 0.455090I$ $a = 0.40063 - 1.96464I$ $b = -0.955090 + 0.232659I$	$4.11234 + 1.63398I$	$10.00000 - 0.53590I$
$u = -1.098680 - 0.455090I$ $a = -1.33142 - 3.69669I$ $b = -0.95509 + 1.96471I$	$4.11234 + 5.69375I$	$10.00000 - 7.46410I$

III. $I_1^v = \langle a,\ b - v + 1,\ v^2 - v + 1 \rangle$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0 \\ v - 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -v \\ v - 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} v \\ -v + 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0 \\ v \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -v \\ v \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4v + 8$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_6	$u^2 - u + 1$
c_2	$u^2 + u + 1$
c_4, c_5, c_8 c_9, c_{10}	u^2
c_7, c_{11}	$(u+1)^2$
c_{12}	$(u-1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_6	$y^2 + y + 1$
c_4, c_5, c_8 c_9, c_{10}	y^2
c_7, c_{11}, c_{12}	$(y-1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$v = 0.500000 + 0.866025I$		
$a = 0$	$1.64493 + 2.02988I$	$6.00000 - 3.46410I$
$b = -0.500000 + 0.866025I$		
$v = 0.500000 - 0.866025I$		
$a = 0$	$1.64493 - 2.02988I$	$6.00000 + 3.46410I$
$b = -0.500000 - 0.866025I$		

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^2-u+1)^5)(u^{127}+62u^{126}+\cdots-34u-25)$
c_2	$((u^2-u+1)^4)(u^2+u+1)(u^{127}-2u^{126}+\cdots+24u-5)$
c_3	$(u^2-u+1)(u^2+u+1)^4(u^{127}+2u^{126}+\cdots-4532584u-667745)$
c_4, c_9	$u^2(u^4-2u^2+2)^2(u^{127}+u^{126}+\cdots-4u-4)$
c_5	$u^2(u^4+2u^2+2)^2(u^{127}-u^{126}+\cdots-7705060u-2511892)$
c_6	$(u^2-u+1)(u^2+u+1)^4(u^{127}-2u^{126}+\cdots+24u-5)$
c_7	$((u-1)^8)(u+1)^2(u^{127}-3u^{126}+\cdots+11u-1)$
c_8	$u^2(u^2+2u+2)^4(u^{127}-61u^{126}+\cdots+80u-16)$
c_{10}	$u^2(u^4+2u^2+2)^2(u^{127}+3u^{126}+\cdots+54716u-9292)$
c_{11}	$((u+1)^{10})(u^{127}-63u^{126}+\cdots-9u-1)$
c_{12}	$((u-1)^2)(u+1)^8(u^{127}-3u^{126}+\cdots+11u-1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y^2+y+1)^5)(y^{127}+14y^{126}+\cdots+23706y-625)$
c_2, c_6	$((y^2+y+1)^5)(y^{127}+62y^{126}+\cdots-34y-25)$
c_3	$(y^2+y+1)^5$ $\cdot(y^{127}-34y^{126}+\cdots+8331046653166y-445883385025)$
c_4, c_9	$y^2(y^2-2y+2)^4(y^{127}-61y^{126}+\cdots+80y-16)$
c_5	$y^2(y^2+2y+2)^4$ $\cdot(y^{127}-29y^{126}+\cdots+382290475250896y-6309601419664)$
c_7, c_{12}	$((y-1)^{10})(y^{127}-63y^{126}+\cdots-9y-1)$
c_8	$y^2(y^2+4)^4(y^{127}+15y^{126}+\cdots-5888y-256)$
c_{10}	$y^2(y^2+2y+2)^4(y^{127}+31y^{126}+\cdots-5.88039\times10^9y-8.63413\times10^7)$
c_{11}	$((y-1)^{10})(y^{127}+17y^{126}+\cdots-473y-1)$