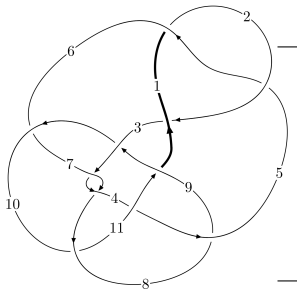
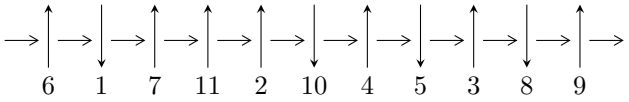
# $11a_{162}$ $(K11a_{162})$




A knot diagram[1]

**Linearized knot diagam**




**Solving Sequence**

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

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

$$\begin{aligned} I_1^u = \langle & -4.14827 \times 10^{147} u^{101} - 7.64747 \times 10^{147} u^{100} + \cdots + 1.69798 \times 10^{147} b + 5.75046 \times 10^{144}, \\ & - 2.00222 \times 10^{146} u^{101} - 2.26353 \times 10^{146} u^{100} + \cdots + 1.69798 \times 10^{147} a + 8.74321 \times 10^{147}, \\ & u^{102} + 2u^{101} + \cdots + 5u - 1 \rangle \\ I_2^u = \langle & 4u^{18} + 3u^{17} + \cdots + b - 5,\ -4u^{18} - 6u^{17} + \cdots + a + 3,\ u^{19} + u^{18} + \cdots + 3u + 1 \rangle \end{aligned}$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 121 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.** $\boldsymbol{I_1^u = \langle -4.15 \times 10^{147} u^{101} - 7.65 \times 10^{147} u^{100} + \cdots + 1.70 \times 10^{147} b + 5.75 \times 10^{144},\ -2.00 \times 10^{146} u^{101} - 2.26 \times 10^{146} u^{100} + \cdots + 1.70 \times 10^{147} a + 8.74 \times 10^{147},\ u^{102} + 2u^{101} + \cdots + 5u - 1 \rangle}$

**(i) Arc colorings**

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u^2 + 1 \\ u^4 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.117918u^{101} + 0.133307u^{100} + \cdots + 12.2631u - 5.14920 \\ 2.44307u^{101} + 4.50387u^{100} + \cdots - 4.24920u - 0.00338666 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -1.05197u^{101} - 1.12612u^{100} + \cdots + 5.29937u - 4.08217 \\ 4.90798u^{101} + 8.02139u^{100} + \cdots - 3.48445u - 0.513579 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1.14572u^{101} + 2.76876u^{100} + \cdots - 11.5438u - 3.13970 \\ -0.725552u^{101} - 2.61060u^{100} + \cdots - 13.1281u + 3.50792 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u \\ u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -1.79267u^{101} - 1.47114u^{100} + \cdots + 17.2481u - 5.63399 \\ 4.35366u^{101} + 6.10832u^{100} + \cdots - 9.23414u + 0.481405 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.708680u^{101} - 1.92696u^{100} + \cdots + 32.4688u - 0.824193 \\ -0.871481u^{101} - 1.34105u^{100} + \cdots - 1.53831u - 0.889909 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -4.67359u^{101} - 7.60736u^{100} + \cdots + 9.22531u + 6.10870 \\ 3.83528u^{101} + 4.33379u^{100} + \cdots + 3.88585u - 2.23360 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -4.67359u^{101} - 7.60736u^{100} + \cdots + 9.22531u + 6.10870 \\ 3.83528u^{101} + 4.33379u^{100} + \cdots + 3.88585u - 2.23360 \end{pmatrix}$$

**(ii) Obstruction class** $= -1$

**(iii) Cusp Shapes** $= 1.09737u^{101} - 1.38542u^{100} + \cdots + 37.0844u + 1.81533$

**(iv) u-Polynomials at the component**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $u^{102} - 2u^{101} + \cdots - 5u - 1$ |
| $c_2$ | $u^{102} + 46u^{101} + \cdots + 37u + 1$ |
| $c_3, c_7$ | $u^{102} - 39u^{100} + \cdots - 21u + 1$ |
| $c_4$ | $u^{102} - 2u^{101} + \cdots + 9118u - 2449$ |
| $c_6$ | $u^{102} - 2u^{101} + \cdots - 326u - 71$ |
| $c_8$ | $u^{102} + 3u^{101} + \cdots - 81u - 19$ |
| $c_9$ | $u^{102} - 14u^{100} + \cdots + 64416u + 8677$ |
| $c_{10}$ | $u^{102} + 3u^{101} + \cdots + 153u - 7$ |
| $c_{11}$ | $u^{102} - 8u^{101} + \cdots - 17631u + 2935$ |

**(v) Riley Polynomials at the component**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $y^{102} + 46y^{101} + \cdots + 37y + 1$ |
| $c_2$ | $y^{102} + 26y^{101} + \cdots - 171y + 1$ |
| $c_3, c_7$ | $y^{102} - 78y^{101} + \cdots + 71y + 1$ |
| $c_4$ | $y^{102} - 24y^{101} + \cdots - 245491930y + 5997601$ |
| $c_6$ | $y^{102} + 16y^{101} + \cdots + 36292y + 5041$ |
| $c_8$ | $y^{102} - 13y^{101} + \cdots - 22977y + 361$ |
| $c_9$ | $y^{102} - 28y^{101} + \cdots - 473410006y + 75290329$ |
| $c_{10}$ | $y^{102} + 13y^{101} + \cdots - 645y + 49$ |
| $c_{11}$ | $y^{102} - 18y^{101} + \cdots + 127701409y + 8614225$ |

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.546716 + 0.841027I$<br>$a = -1.19778 + 1.67154I$<br>$b = 0.181876 - 1.221980I$ | $5.02215 + 2.31431I$ | 0 |
| $u = 0.546716 - 0.841027I$<br>$a = -1.19778 - 1.67154I$<br>$b = 0.181876 + 1.221980I$ | $5.02215 - 2.31431I$ | 0 |
| $u = -0.910994 + 0.431263I$<br>$a = 1.33540 + 0.86176I$<br>$b = 0.152736 - 1.327330I$ | $6.30779 + 12.49790I$ | 0 |
| $u = -0.910994 - 0.431263I$<br>$a = 1.33540 - 0.86176I$<br>$b = 0.152736 + 1.327330I$ | $6.30779 - 12.49790I$ | 0 |
| $u = 0.913597 + 0.430094I$<br>$a = 1.30200 - 0.68866I$<br>$b = 0.205987 + 1.215020I$ | $1.31002 - 6.75104I$ | 0 |
| $u = 0.913597 - 0.430094I$<br>$a = 1.30200 + 0.68866I$<br>$b = 0.205987 - 1.215020I$ | $1.31002 + 6.75104I$ | 0 |
| $u = 0.518131 + 0.866736I$<br>$a = -1.32102 + 0.75450I$<br>$b = 1.63015 - 1.94328I$ | $4.96667 + 1.96860I$ | 0 |
| $u = 0.518131 - 0.866736I$<br>$a = -1.32102 - 0.75450I$<br>$b = 1.63015 + 1.94328I$ | $4.96667 - 1.96860I$ | 0 |
| $u = -0.936988 + 0.299819I$<br>$a = 1.62091 + 0.34671I$<br>$b = 0.232284 - 0.722761I$ | $5.22245 - 0.61170I$ | 0 |
| $u = -0.936988 - 0.299819I$<br>$a = 1.62091 - 0.34671I$<br>$b = 0.232284 + 0.722761I$ | $5.22245 + 0.61170I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.348224+0.918489I$<br>$a=\ \ 0.068949-0.830583I$<br>$b=-0.452913-0.345870I$ | $-1.76294-2.23528I$ | 0 |
| $u=-0.348224-0.918489I$<br>$a=\ \ 0.068949+0.830583I$<br>$b=-0.452913+0.345870I$ | $-1.76294+2.23528I$ | 0 |
| $u=-0.424020+0.928079I$<br>$a=-0.042068+0.667634I$<br>$b=\ \ 1.140310+0.517906I$ | $-2.05900-0.88708I$ | 0 |
| $u=-0.424020-0.928079I$<br>$a=-0.042068-0.667634I$<br>$b=\ \ 1.140310-0.517906I$ | $-2.05900+0.88708I$ | 0 |
| $u=\ \ 0.768345+0.605608I$<br>$a=\ \ 1.130330+0.351165I$<br>$b=-0.99774+1.41995I$ | $7.07739-3.89935I$ | 0 |
| $u=\ \ 0.768345-0.605608I$<br>$a=\ \ 1.130330-0.351165I$<br>$b=-0.99774-1.41995I$ | $7.07739+3.89935I$ | 0 |
| $u=-0.161509+1.011950I$<br>$a=\ \ 1.237860+0.371151I$<br>$b=-0.396058+0.014652I$ | $1.72657+1.42609I$ | 0 |
| $u=-0.161509-1.011950I$<br>$a=\ \ 1.237860-0.371151I$<br>$b=-0.396058-0.014652I$ | $1.72657-1.42609I$ | 0 |
| $u=-0.762854+0.685546I$<br>$a=-0.77801-1.50504I$<br>$b=-0.21488+1.47469I$ | $5.99433+2.25625I$ | 0 |
| $u=-0.762854-0.685546I$<br>$a=-0.77801+1.50504I$<br>$b=-0.21488-1.47469I$ | $5.99433-2.25625I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.381025+0.968579I$<br>$a=\ \ 2.32662+0.53559I$<br>$b=-2.41585-0.71894I$ | $0.30261+2.42814I$ | 0 |
| $u=-0.381025-0.968579I$<br>$a=\ \ 2.32662-0.53559I$<br>$b=-2.41585+0.71894I$ | $0.30261-2.42814I$ | 0 |
| $u=\ \ 0.380432+0.982651I$<br>$a=\ \ 1.51391-0.96311I$<br>$b=-1.62844+1.33790I$ | $-3.75520+1.20274I$ | 0 |
| $u=\ \ 0.380432-0.982651I$<br>$a=\ \ 1.51391+0.96311I$<br>$b=-1.62844-1.33790I$ | $-3.75520-1.20274I$ | 0 |
| $u=\ \ 0.907967+0.542230I$<br>$a=-0.358082+0.812397I$<br>$b=-0.233116-0.784920I$ | $3.25805-3.74660I$ | 0 |
| $u=\ \ 0.907967-0.542230I$<br>$a=-0.358082-0.812397I$<br>$b=-0.233116+0.784920I$ | $3.25805+3.74660I$ | 0 |
| $u=\ \ 0.336564+1.002720I$<br>$a=\ \ 0.793503-0.833640I$<br>$b=\ \ 0.354003+0.058896I$ | $-0.65253-2.63980I$ | 0 |
| $u=\ \ 0.336564-1.002720I$<br>$a=\ \ 0.793503+0.833640I$<br>$b=\ \ 0.354003-0.058896I$ | $-0.65253+2.63980I$ | 0 |
| $u=-0.867660+0.335592I$<br>$a=-0.547466-0.238777I$<br>$b=\ \ 0.267014+0.446348I$ | $1.38934+0.39182I$ | 0 |
| $u=-0.867660-0.335592I$<br>$a=-0.547466+0.238777I$<br>$b=\ \ 0.267014-0.446348I$ | $1.38934-0.39182I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.838051+0.668944I$<br>$a=\ \ 1.075680-0.069757I$<br>$b=-0.646687-1.246750I$ | $2.82119-2.36401I$ | 0 |
| $u=-0.838051-0.668944I$<br>$a=\ \ 1.075680+0.069757I$<br>$b=-0.646687+1.246750I$ | $2.82119+2.36401I$ | 0 |
| $u=-0.504029+0.951532I$<br>$a=-2.24845-0.35174I$<br>$b=\ \ 1.96204+2.04629I$ | $-1.51432-4.25684I$ | 0 |
| $u=-0.504029-0.951532I$<br>$a=-2.24845+0.35174I$<br>$b=\ \ 1.96204-2.04629I$ | $-1.51432+4.25684I$ | 0 |
| $u=\ \ 0.886342+0.637949I$<br>$a=\ \ 0.939358+0.188412I$<br>$b=-0.867093+0.989781I$ | $7.56384+8.00259I$ | 0 |
| $u=\ \ 0.886342-0.637949I$<br>$a=\ \ 0.939358-0.188412I$<br>$b=-0.867093-0.989781I$ | $7.56384-8.00259I$ | 0 |
| $u=-0.505158+0.979164I$<br>$a=-1.39013+0.56499I$<br>$b=\ \ 1.10432-1.25247I$ | $1.08112-8.06609I$ | 0 |
| $u=-0.505158-0.979164I$<br>$a=-1.39013-0.56499I$<br>$b=\ \ 1.10432+1.25247I$ | $1.08112+8.06609I$ | 0 |
| $u=\ \ 0.711464+0.542127I$<br>$a=-1.09507+1.07155I$<br>$b=\ \ 0.116144-1.373020I$ | $2.68100-2.12226I$ | 0 |
| $u=\ \ 0.711464-0.542127I$<br>$a=-1.09507-1.07155I$<br>$b=\ \ 0.116144+1.373020I$ | $2.68100+2.12226I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.472446 + 1.007140I$<br>$a = -0.498508 - 0.459792I$<br>$b = 0.226557 + 1.275670I$ | $-3.15750 + 4.83334I$ | 0 |
| $u = 0.472446 - 1.007140I$<br>$a = -0.498508 + 0.459792I$<br>$b = 0.226557 - 1.275670I$ | $-3.15750 - 4.83334I$ | 0 |
| $u = 0.512406 + 1.014650I$<br>$a = -2.28814 + 0.84392I$<br>$b = 1.63835 - 2.12595I$ | $0.47157 + 8.78333I$ | 0 |
| $u = 0.512406 - 1.014650I$<br>$a = -2.28814 - 0.84392I$<br>$b = 1.63835 + 2.12595I$ | $0.47157 - 8.78333I$ | 0 |
| $u = -0.443690 + 0.740067I$<br>$a = -1.47397 - 2.10514I$<br>$b = -0.38964 + 1.77473I$ | $-0.768256 + 0.283969I$ | 0 |
| $u = -0.443690 - 0.740067I$<br>$a = -1.47397 + 2.10514I$<br>$b = -0.38964 - 1.77473I$ | $-0.768256 - 0.283969I$ | 0 |
| $u = -0.485068 + 1.040750I$<br>$a = 1.083250 + 0.313226I$<br>$b = -0.96238 - 1.16637I$ | $-0.62443 - 3.83028I$ | 0 |
| $u = -0.485068 - 1.040750I$<br>$a = 1.083250 - 0.313226I$<br>$b = -0.96238 + 1.16637I$ | $-0.62443 + 3.83028I$ | 0 |
| $u = -0.714449 + 0.446789I$<br>$a = -1.39364 - 0.82917I$<br>$b = 0.49665 + 1.57085I$ | $6.25851 + 3.14258I$ | $12.90912 - 3.40540I$ |
| $u = -0.714449 - 0.446789I$<br>$a = -1.39364 + 0.82917I$<br>$b = 0.49665 - 1.57085I$ | $6.25851 - 3.14258I$ | $12.90912 + 3.40540I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.010623+1.160570I$<br>$a=\ 0.399937-0.342167I$<br>$b=-0.549931-0.398269I$ | $-3.22104-2.07457I$ | 0 |
| $u=-0.010623-1.160570I$<br>$a=\ 0.399937+0.342167I$<br>$b=-0.549931+0.398269I$ | $-3.22104+2.07457I$ | 0 |
| $u=\ 0.184970+0.814478I$<br>$a=\ 1.089970-0.393382I$<br>$b=-0.304161-0.600628I$ | $-1.71950-1.55631I$ | $0.+5.16105I$ |
| $u=\ 0.184970-0.814478I$<br>$a=\ 1.089970+0.393382I$<br>$b=-0.304161+0.600628I$ | $-1.71950+1.55631I$ | $0.-5.16105I$ |
| $u=-0.315832+1.121810I$<br>$a=\ 0.285651+1.088590I$<br>$b=-0.80567-1.77754I$ | $0.64011-4.17517I$ | 0 |
| $u=-0.315832-1.121810I$<br>$a=\ 0.285651-1.088590I$<br>$b=-0.80567+1.77754I$ | $0.64011+4.17517I$ | 0 |
| $u=\ 0.380666+1.110880I$<br>$a=\ 0.728299+0.343784I$<br>$b=-0.854582+0.712671I$ | $-1.02724+3.84003I$ | 0 |
| $u=\ 0.380666-1.110880I$<br>$a=\ 0.728299-0.343784I$<br>$b=-0.854582-0.712671I$ | $-1.02724-3.84003I$ | 0 |
| $u=-0.662917+0.979688I$<br>$a=-1.89971-0.56380I$<br>$b=\ 1.80912+1.53790I$ | $5.08526-7.66215I$ | 0 |
| $u=-0.662917-0.979688I$<br>$a=-1.89971+0.56380I$<br>$b=\ 1.80912-1.53790I$ | $5.08526+7.66215I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.403141+0.700006I$<br>$a=\ \ 1.58780-0.55446I$<br>$b=-0.62884+1.29837I$ | $2.08822+4.14738I$ | $5.91848-4.99016I$ |
| $u=-0.403141-0.700006I$<br>$a=\ \ 1.58780+0.55446I$<br>$b=-0.62884-1.29837I$ | $2.08822-4.14738I$ | $5.91848+4.99016I$ |
| $u=-0.689076+0.977800I$<br>$a=\ \ 0.994641+0.951390I$<br>$b=\ \ 0.15446-1.53287I$ | $1.87918-3.30865I$ | 0 |
| $u=-0.689076-0.977800I$<br>$a=\ \ 0.994641-0.951390I$<br>$b=\ \ 0.15446+1.53287I$ | $1.87918+3.30865I$ | 0 |
| $u=\ \ 0.605344+1.038500I$<br>$a=-1.75704+0.85997I$<br>$b=\ \ 1.42964-1.72434I$ | $1.19886+7.18632I$ | 0 |
| $u=\ \ 0.605344-1.038500I$<br>$a=-1.75704-0.85997I$<br>$b=\ \ 1.42964+1.72434I$ | $1.19886-7.18632I$ | 0 |
| $u=\ \ 0.649296+1.019550I$<br>$a=\ \ 0.87338-1.39300I$<br>$b=\ \ 0.61169+1.58068I$ | $5.82598+9.26479I$ | 0 |
| $u=\ \ 0.649296-1.019550I$<br>$a=\ \ 0.87338+1.39300I$<br>$b=\ \ 0.61169-1.58068I$ | $5.82598-9.26479I$ | 0 |
| $u=\ \ 0.526098+1.098500I$<br>$a=-0.37261+1.45756I$<br>$b=\ \ 0.13000-1.71542I$ | $4.36168+3.54189I$ | 0 |
| $u=\ \ 0.526098-1.098500I$<br>$a=-0.37261-1.45756I$<br>$b=\ \ 0.13000+1.71542I$ | $4.36168-3.54189I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.645470 + 0.436272I$<br>$a = -1.51263 - 0.10162I$<br>$b = 1.192850 - 0.631249I$ | $6.34669 + 1.05018I$ | $13.33822 - 2.96795I$ |
| $u = 0.645470 - 0.436272I$<br>$a = -1.51263 + 0.10162I$<br>$b = 1.192850 + 0.631249I$ | $6.34669 - 1.05018I$ | $13.33822 + 2.96795I$ |
| $u = 0.777412$<br>$a = 0.335267$<br>$b = 0.863939$ | 2.43364 | 3.98710 |
| $u = -0.586836 + 1.074450I$<br>$a = -1.74670 - 1.33399I$<br>$b = 1.16360 + 2.01117I$ | $4.41615 - 8.13681I$ | 0 |
| $u = -0.586836 - 1.074450I$<br>$a = -1.74670 + 1.33399I$<br>$b = 1.16360 - 2.01117I$ | $4.41615 + 8.13681I$ | 0 |
| $u = 0.754022 + 1.016080I$<br>$a = 0.531329 - 0.867731I$<br>$b = 0.341734 + 1.088120I$ | $6.42583 - 1.99123I$ | 0 |
| $u = 0.754022 - 1.016080I$<br>$a = 0.531329 + 0.867731I$<br>$b = 0.341734 - 1.088120I$ | $6.42583 + 1.99123I$ | 0 |
| $u = -0.077721 + 1.282840I$<br>$a = -0.350452 + 0.006592I$<br>$b = -0.345037 - 0.763343I$ | $0.16785 + 9.63948I$ | 0 |
| $u = -0.077721 - 1.282840I$<br>$a = -0.350452 - 0.006592I$<br>$b = -0.345037 + 0.763343I$ | $0.16785 - 9.63948I$ | 0 |
| $u = 0.685100 + 1.110090I$<br>$a = -1.239840 + 0.322500I$<br>$b = 1.24636 - 0.96116I$ | $1.48920 + 9.62261I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.685100 - 1.110090I$<br>$a = -1.239840 - 0.322500I$<br>$b = 1.24636 + 0.96116I$ | $1.48920 - 9.62261I$ | 0 |
| $u = -0.623130 + 1.152470I$<br>$a = -0.816737 - 0.612012I$<br>$b = 0.731605 + 1.070220I$ | $-1.01285 - 5.88545I$ | 0 |
| $u = -0.623130 - 1.152470I$<br>$a = -0.816737 + 0.612012I$<br>$b = 0.731605 - 1.070220I$ | $-1.01285 + 5.88545I$ | 0 |
| $u = 0.070552 + 1.313550I$<br>$a = -0.0567565 - 0.0089612I$<br>$b = -0.590662 + 0.645402I$ | $-4.91138 - 3.81366I$ | 0 |
| $u = 0.070552 - 1.313550I$<br>$a = -0.0567565 + 0.0089612I$<br>$b = -0.590662 - 0.645402I$ | $-4.91138 + 3.81366I$ | 0 |
| $u = 0.656232 + 1.143470I$<br>$a = 1.47930 - 0.87156I$<br>$b = -1.26803 + 2.14541I$ | $-0.85558 + 12.50630I$ | 0 |
| $u = 0.656232 - 1.143470I$<br>$a = 1.47930 + 0.87156I$<br>$b = -1.26803 - 2.14541I$ | $-0.85558 - 12.50630I$ | 0 |
| $u = -0.654776 + 1.144510I$<br>$a = 1.59713 + 0.98601I$<br>$b = -1.38915 - 2.21983I$ | $4.1396 - 18.2450I$ | 0 |
| $u = -0.654776 - 1.144510I$<br>$a = 1.59713 - 0.98601I$<br>$b = -1.38915 + 2.21983I$ | $4.1396 + 18.2450I$ | 0 |
| $u = -0.613398 + 0.253704I$<br>$a = 0.726159 + 0.137434I$<br>$b = 0.348798 - 0.412040I$ | $1.49929 - 0.29141I$ | $5.98153 + 0.11289I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.613398-0.253704I$<br>$a=\ \ 0.726159-0.137434I$<br>$b=\ \ 0.348798+0.412040I$ | $1.49929+0.29141I$ | $5.98153-0.11289I$ |
| $u=-0.639970$<br>$a=\ \ 0.00425908$<br>$b=\ \ 0.486824$ | 1.15599 | 11.7830 |
| $u=\ \ 0.300150+0.557793I$<br>$a=-2.11925+1.68467I$<br>$b=\ \ 0.16460-1.80636I$ | $1.94932-4.82613I$ | $5.93840+5.80122I$ |
| $u=\ \ 0.300150-0.557793I$<br>$a=-2.11925-1.68467I$<br>$b=\ \ 0.16460+1.80636I$ | $1.94932+4.82613I$ | $5.93840-5.80122I$ |
| $u=-0.687034+1.194130I$<br>$a=\ \ 1.117490+0.759585I$<br>$b=-1.04280-2.27076I$ | $2.56452-5.34624I$ | 0 |
| $u=-0.687034-1.194130I$<br>$a=\ \ 1.117490-0.759585I$<br>$b=-1.04280+2.27076I$ | $2.56452+5.34624I$ | 0 |
| $u=-0.235498+1.372370I$<br>$a=\ \ 0.214681-0.146318I$<br>$b=-0.370603+0.393439I$ | $-4.11255-3.30494I$ | 0 |
| $u=-0.235498-1.372370I$<br>$a=\ \ 0.214681+0.146318I$<br>$b=-0.370603-0.393439I$ | $-4.11255+3.30494I$ | 0 |
| $u=\ \ 0.290031+0.120688I$<br>$a=\ \ 2.87656+0.87251I$<br>$b=-0.070464-0.476487I$ | $-1.38492-1.35842I$ | $-0.44992+2.98076I$ |
| $u=\ \ 0.290031-0.120688I$<br>$a=\ \ 2.87656-0.87251I$<br>$b=-0.070464+0.476487I$ | $-1.38492+1.35842I$ | $-0.44992-2.98076I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \quad 0.072640 + 0.207452I$ | | |
| $a = -4.59578 + 2.52040I$ | $1.92621 - 4.88869I$ | $6.37356 + 5.88182I$ |
| $b = \quad 0.216472 - 1.280150I$ | | |
| $u = \quad 0.072640 - 0.207452I$ | | |
| $a = -4.59578 - 2.52040I$ | $1.92621 + 4.88869I$ | $6.37356 - 5.88182I$ |
| $b = \quad 0.216472 + 1.280150I$ | | |

**II.**

$\boldsymbol{I_2^u = \langle 4u^{18}+3u^{17}+\cdots+b-5,\ -4u^{18}-6u^{17}+\cdots+a+3,\ u^{19}+u^{18}+\cdots+3u+1\rangle}$

**(i) Arc colorings**

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u^2+1 \\ u^4 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 4u^{18}+6u^{17}+\cdots-u-3 \\ -4u^{18}-3u^{17}+\cdots+11u+5 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 3u^{18}+5u^{17}+\cdots-u-2 \\ -3u^{18}-2u^{17}+\cdots+11u+5 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -4u^{18}-5u^{17}+\cdots+6u+4 \\ 6u^{18}+10u^{17}+\cdots+24u^2+8u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u \\ u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 4u^{18}+5u^{17}+\cdots-10u-6 \\ -4u^{18}-2u^{17}+\cdots+20u+8 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -6u^{18}-4u^{17}+\cdots+12u+3 \\ 6u^{18}+7u^{17}+\cdots-u-1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 2u^{18}+9u^{16}+\cdots-3u+1 \\ 3u^{18}+6u^{17}+\cdots+21u^2+8u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 2u^{18}+9u^{16}+\cdots-3u+1 \\ 3u^{18}+6u^{17}+\cdots+21u^2+8u \end{pmatrix}$$

**(ii) Obstruction class** $= 1$

**(iii) Cusp Shapes** $= 9u^{18}-7u^{17}+21u^{16}-64u^{15}-7u^{14}-180u^{13}-111u^{12}-308u^{11}-298u^{10}-355u^9-411u^8-322u^7-405u^6-284u^5-267u^4-199u^3-123u^2-75u-18$

**(iv) u-Polynomials at the component**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $u^{19}+u^{18}+\cdots+3u+1$ |
| $c_2$ | $u^{19}+11u^{18}+\cdots-3u-1$ |
| $c_3$ | $u^{19}-u^{18}+\cdots+3u+1$ |
| $c_4$ | $u^{19}+u^{18}+\cdots+4u^2-1$ |
| $c_5$ | $u^{19}-u^{18}+\cdots+3u-1$ |
| $c_6$ | $u^{19}+u^{18}+\cdots+2u-1$ |
| $c_7$ | $u^{19}+u^{18}+\cdots+3u-1$ |
| $c_8$ | $u^{19}-4u^{17}+\cdots-u+1$ |
| $c_9$ | $u^{19}-u^{18}+\cdots-4u+1$ |
| $c_{10}$ | $u^{19}+10u^{18}+\cdots+u+1$ |
| $c_{11}$ | $u^{19}-9u^{18}+\cdots+9u-1$ |

**(v) Riley Polynomials at the component**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $y^{19} + 11y^{18} + \cdots - 3y - 1$ |
| $c_2$ | $y^{19} - y^{18} + \cdots + y - 1$ |
| $c_3, c_7$ | $y^{19} - 17y^{18} + \cdots + 11y - 1$ |
| $c_4$ | $y^{19} - 3y^{18} + \cdots + 8y - 1$ |
| $c_6$ | $y^{19} + 5y^{18} + \cdots - 2y - 1$ |
| $c_8$ | $y^{19} - 8y^{18} + \cdots + 3y - 1$ |
| $c_9$ | $y^{19} + y^{18} + \cdots + 16y - 1$ |
| $c_{10}$ | $y^{19} + 6y^{18} + \cdots + 11y - 1$ |
| $c_{11}$ | $y^{19} + 7y^{18} + \cdots - 3y - 1$ |

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.756785 + 0.627945I$<br>$a = -0.452433 + 0.973447I$<br>$b = -0.207776 - 1.275560I$ | $4.17315 - 3.45944I$ | $9.43557 + 4.00641I$ |
| $u = 0.756785 - 0.627945I$<br>$a = -0.452433 - 0.973447I$<br>$b = -0.207776 + 1.275560I$ | $4.17315 + 3.45944I$ | $9.43557 - 4.00641I$ |
| $u = 0.339623 + 0.919258I$<br>$a = 2.24756 - 0.52382I$<br>$b = -1.321130 + 0.107053I$ | $0.86544 - 3.34083I$ | $3.34354 + 4.41577I$ |
| $u = 0.339623 - 0.919258I$<br>$a = 2.24756 + 0.52382I$<br>$b = -1.321130 - 0.107053I$ | $0.86544 + 3.34083I$ | $3.34354 - 4.41577I$ |
| $u = 0.289824 + 0.910566I$<br>$a = -0.139626 - 1.198030I$<br>$b = 0.45271 + 2.08321I$ | $0.97791 + 5.98873I$ | $3.06705 - 8.24706I$ |
| $u = 0.289824 - 0.910566I$<br>$a = -0.139626 + 1.198030I$<br>$b = 0.45271 - 2.08321I$ | $0.97791 - 5.98873I$ | $3.06705 + 8.24706I$ |
| $u = -0.412083 + 1.018240I$<br>$a = 0.838502 - 0.039949I$<br>$b = -0.96015 - 1.15690I$ | $-2.67947 - 3.32318I$ | $-4.16053 + 3.59653I$ |
| $u = -0.412083 - 1.018240I$<br>$a = 0.838502 + 0.039949I$<br>$b = -0.96015 + 1.15690I$ | $-2.67947 + 3.32318I$ | $-4.16053 - 3.59653I$ |
| $u = -0.295559 + 0.809856I$<br>$a = 0.86554 + 1.47296I$<br>$b = 0.422703 - 0.430824I$ | $-1.72030 + 0.39989I$ | $-1.68186 - 0.51618I$ |
| $u = -0.295559 - 0.809856I$<br>$a = 0.86554 - 1.47296I$<br>$b = 0.422703 + 0.430824I$ | $-1.72030 - 0.39989I$ | $-1.68186 + 0.51618I$ |

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.849830$<br>$a=\ \ 0.195511$<br>$b=\ \ 0.504885$ | $0.655524$ | $-7.38950$ |
| $u=\ \ 0.612447+1.019280I$<br>$a=-1.83602+0.52614I$<br>$b=\ \ 1.41766-1.16542I$ | $2.94345+8.65071I$ | $5.93756-9.11510I$ |
| $u=\ \ 0.612447-1.019280I$<br>$a=-1.83602-0.52614I$<br>$b=\ \ 1.41766+1.16542I$ | $2.94345-8.65071I$ | $5.93756+9.11510I$ |
| $u=-0.643913+1.140600I$<br>$a=-1.18488-0.86715I$<br>$b=\ \ 1.04791+2.13371I$ | $2.40281-5.12847I$ | $0.682236-1.181576I$ |
| $u=-0.643913-1.140600I$<br>$a=-1.18488+0.86715I$<br>$b=\ \ 1.04791-2.13371I$ | $2.40281+5.12847I$ | $0.682236+1.181576I$ |
| $u=-0.185848+1.360350I$<br>$a=\ \ 0.0181661+0.0703459I$<br>$b=\ \ 0.260654-0.457432I$ | $-4.05934-3.53517I$ | $6.8503+17.2063I$ |
| $u=-0.185848-1.360350I$<br>$a=\ \ 0.0181661-0.0703459I$<br>$b=\ \ 0.260654+0.457432I$ | $-4.05934+3.53517I$ | $6.8503-17.2063I$ |
| $u=-0.536362+0.225069I$<br>$a=-2.45456-0.82764I$<br>$b=\ \ 0.634975+0.421993I$ | $4.99327-0.03621I$ | $8.72091-1.39804I$ |
| $u=-0.536362-0.225069I$<br>$a=-2.45456+0.82764I$<br>$b=\ \ 0.634975-0.421993I$ | $4.99327+0.03621I$ | $8.72091+1.39804I$ |

**III. u-Polynomials**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $(u^{19}+u^{18}+\cdots+3u+1)(u^{102}-2u^{101}+\cdots-5u-1)$ |
| $c_2$ | $(u^{19}+11u^{18}+\cdots-3u-1)(u^{102}+46u^{101}+\cdots+37u+1)$ |
| $c_3$ | $(u^{19}-u^{18}+\cdots+3u+1)(u^{102}-39u^{100}+\cdots-21u+1)$ |
| $c_4$ | $(u^{19}+u^{18}+\cdots+4u^2-1)(u^{102}-2u^{101}+\cdots+9118u-2449)$ |
| $c_5$ | $(u^{19}-u^{18}+\cdots+3u-1)(u^{102}-2u^{101}+\cdots-5u-1)$ |
| $c_6$ | $(u^{19}+u^{18}+\cdots+2u-1)(u^{102}-2u^{101}+\cdots-326u-71)$ |
| $c_7$ | $(u^{19}+u^{18}+\cdots+3u-1)(u^{102}-39u^{100}+\cdots-21u+1)$ |
| $c_8$ | $(u^{19}-4u^{17}+\cdots-u+1)(u^{102}+3u^{101}+\cdots-81u-19)$ |
| $c_9$ | $(u^{19}-u^{18}+\cdots-4u+1)(u^{102}-14u^{100}+\cdots+64416u+8677)$ |
| $c_{10}$ | $(u^{19}+10u^{18}+\cdots+u+1)(u^{102}+3u^{101}+\cdots+153u-7)$ |
| $c_{11}$ | $(u^{19}-9u^{18}+\cdots+9u-1)(u^{102}-8u^{101}+\cdots-17631u+2935)$ |

**IV. Riley Polynomials**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $(y^{19}+11y^{18}+\cdots-3y-1)(y^{102}+46y^{101}+\cdots+37y+1)$ |
| $c_2$ | $(y^{19}-y^{18}+\cdots+y-1)(y^{102}+26y^{101}+\cdots-171y+1)$ |
| $c_3, c_7$ | $(y^{19}-17y^{18}+\cdots+11y-1)(y^{102}-78y^{101}+\cdots+71y+1)$ |
| $c_4$ | $(y^{19}-3y^{18}+\cdots+8y-1)$ $\cdot(y^{102}-24y^{101}+\cdots-245491930y+5997601)$ |
| $c_6$ | $(y^{19}+5y^{18}+\cdots-2y-1)(y^{102}+16y^{101}+\cdots+36292y+5041)$ |
| $c_8$ | $(y^{19}-8y^{18}+\cdots+3y-1)(y^{102}-13y^{101}+\cdots-22977y+361)$ |
| $c_9$ | $(y^{19}+y^{18}+\cdots+16y-1)$ $\cdot(y^{102}-28y^{101}+\cdots-473410006y+75290329)$ |
| $c_{10}$ | $(y^{19}+6y^{18}+\cdots+11y-1)(y^{102}+13y^{101}+\cdots-645y+49)$ |
| $c_{11}$ | $(y^{19}+7y^{18}+\cdots-3y-1)$ $\cdot(y^{102}-18y^{101}+\cdots+127701409y+8614225)$ |