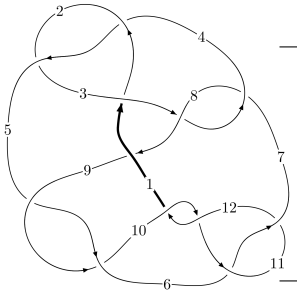
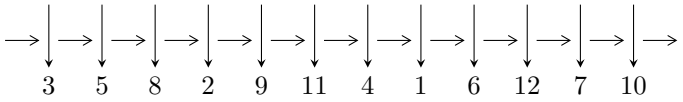
## $12a_{0082}$ $(K12a_{0082})$




A knot diagram[1]

**Linearized knot diagam**




**Solving Sequence**

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

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

$$I_1^u = \langle u^{102} + u^{101} + \cdots + b - 1,\ -u^{99} + 16u^{97} + \cdots + a + 2u,\ u^{103} + 2u^{102} + \cdots + 6u^2 - 1 \rangle$$
$$I_2^u = \langle u^7 - u^5 + 2u^3 + b - u + 1,\ u^7 - u^5 + u^4 + 2u^3 - u^2 + a + 2,\ u^8 - u^7 - u^6 + 2u^5 + u^4 - 2u^3 + 2u - 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 111 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. $I_1^u =$**
**$\langle u^{102}+u^{101}+\cdots+b-1,\ -u^{99}+16u^{97}+\cdots+a+2u,\ u^{103}+2u^{102}+\cdots+6u^2-1\rangle$**

**(i) Arc colorings**

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^{99} - 16u^{97} + \cdots - 3u^2 - 2u \\ -u^{102} - u^{101} + \cdots + u + 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^{17} + 2u^{15} - 5u^{13} + 6u^{11} - 7u^9 + 6u^7 - 2u^5 + 2u^3 + u \\ -u^{19} + 3u^{17} - 8u^{15} + 13u^{13} - 17u^{11} + 17u^9 - 12u^7 + 8u^5 - 3u^3 + u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -2u^{102} - 2u^{101} + \cdots - 3u + 1 \\ -u^{102} - u^{101} + \cdots - 4u^2 + 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^3 \\ u^5 - u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^5 - u \\ -u^7 + u^5 - 2u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^5 + u \\ u^5 - u^3 + u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^{10} + u^8 - 2u^6 + u^4 - u^2 + 1 \\ -u^{10} + 2u^8 - 3u^6 + 2u^4 - u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -u^{102} - u^{101} + \cdots - 2u + 1 \\ -u^{102} - u^{101} + \cdots + u + 1 \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= 11u^{102} + 10u^{101} + \cdots - 4u - 21$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $u^{103} + 49u^{102} + \cdots + 72u + 1$ |
| $c_2, c_4$ | $u^{103} - 9u^{102} + \cdots - 2u + 1$ |
| $c_3, c_7$ | $u^{103} + u^{102} + \cdots + 896u + 256$ |
| $c_5, c_9$ | $u^{103} + 2u^{102} + \cdots + 126u + 9$ |
| $c_6, c_{11}$ | $u^{103} - 2u^{102} + \cdots - 6u^2 + 1$ |
| $c_8$ | $u^{103} - 8u^{102} + \cdots + 326018u + 52865$ |
| $c_{10}, c_{12}$ | $u^{103} + 36u^{102} + \cdots + 12u + 1$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $y^{103} + 19y^{102} + \cdots + 1672y - 1$ |
| $c_2, c_4$ | $y^{103} - 49y^{102} + \cdots + 72y - 1$ |
| $c_3, c_7$ | $y^{103} + 51y^{102} + \cdots - 1130496y - 65536$ |
| $c_5, c_9$ | $y^{103} - 68y^{102} + \cdots - 22536y - 81$ |
| $c_6, c_{11}$ | $y^{103} - 36y^{102} + \cdots + 12y - 1$ |
| $c_8$ | $y^{103} + 16y^{102} + \cdots - 53970185116y - 2794708225$ |
| $c_{10}, c_{12}$ | $y^{103} + 64y^{102} + \cdots - 68y - 1$ |

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

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.912335+0.408500I$<br>$a=2.31902-0.54728I$<br>$b=0.584528-0.968145I$ | $0.08009+7.90391I$ | 0 |
| $u=-0.912335-0.408500I$<br>$a=2.31902+0.54728I$<br>$b=0.584528+0.968145I$ | $0.08009-7.90391I$ | 0 |
| $u=0.616846+0.780917I$<br>$a=0.639980+0.490478I$<br>$b=-1.65356+0.05660I$ | $-0.99710+5.42375I$ | 0 |
| $u=0.616846-0.780917I$<br>$a=0.639980-0.490478I$<br>$b=-1.65356-0.05660I$ | $-0.99710-5.42375I$ | 0 |
| $u=-0.881449+0.484517I$<br>$a=-1.60696+0.38647I$<br>$b=-0.254925+0.557993I$ | $1.89796+2.95652I$ | 0 |
| $u=-0.881449-0.484517I$<br>$a=-1.60696-0.38647I$<br>$b=-0.254925-0.557993I$ | $1.89796-2.95652I$ | 0 |
| $u=1.005320+0.087510I$<br>$a=0.54041+1.59055I$<br>$b=0.289073+0.524898I$ | $-0.23823-2.28486I$ | 0 |
| $u=1.005320-0.087510I$<br>$a=0.54041-1.59055I$<br>$b=0.289073-0.524898I$ | $-0.23823+2.28486I$ | 0 |
| $u=-0.624209+0.794738I$<br>$a=-1.097790+0.679494I$<br>$b=1.43840+2.14786I$ | $3.77337-6.03756I$ | 0 |
| $u=-0.624209-0.794738I$<br>$a=-1.097790-0.679494I$<br>$b=1.43840-2.14786I$ | $3.77337+6.03756I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.613526+0.803225I$<br>$a=\ \ 1.31576-0.53967I$<br>$b=-1.56697-2.36415I$ | $1.44101-11.65940I$ | 0 |
| $u=-0.613526-0.803225I$<br>$a=\ \ 1.31576+0.53967I$<br>$b=-1.56697+2.36415I$ | $1.44101+11.65940I$ | 0 |
| $u=-0.614579+0.767089I$<br>$a=\ \ 1.15511-1.33576I$<br>$b=-1.84696-1.71453I$ | $-1.91217-2.88103I$ | 0 |
| $u=-0.614579-0.767089I$<br>$a=\ \ 1.15511+1.33576I$<br>$b=-1.84696+1.71453I$ | $-1.91217+2.88103I$ | 0 |
| $u=\ \ 0.631063+0.747905I$<br>$a=-0.656987-0.310998I$<br>$b=\ \ 1.314400-0.477130I$ | $0.307513+1.061580I$ | 0 |
| $u=\ \ 0.631063-0.747905I$<br>$a=-0.656987+0.310998I$<br>$b=\ \ 1.314400+0.477130I$ | $0.307513-1.061580I$ | 0 |
| $u=-0.672704+0.770186I$<br>$a=-0.233235+0.783530I$<br>$b=\ \ 0.75052+1.40903I$ | $5.58134-2.28100I$ | 0 |
| $u=-0.672704-0.770186I$<br>$a=-0.233235-0.783530I$<br>$b=\ \ 0.75052-1.40903I$ | $5.58134+2.28100I$ | 0 |
| $u=-0.702746+0.759112I$<br>$a=-0.085346-0.728100I$<br>$b=-0.403150-1.083490I$ | $4.66987+3.22738I$ | 0 |
| $u=-0.702746-0.759112I$<br>$a=-0.085346+0.728100I$<br>$b=-0.403150+1.083490I$ | $4.66987-3.22738I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.559939 + 0.767741I$<br>$a = 0.186132 + 0.629586I$<br>$b = -0.911639 - 0.783862I$ | $-2.37667 - 0.08774I$ | 0 |
| $u = 0.559939 - 0.767741I$<br>$a = 0.186132 - 0.629586I$<br>$b = -0.911639 + 0.783862I$ | $-2.37667 + 0.08774I$ | 0 |
| $u = 0.934664 + 0.166620I$<br>$a = 0.25189 - 1.89766I$<br>$b = 0.409310 - 0.451135I$ | $-1.07874 + 2.57674I$ | 0 |
| $u = 0.934664 - 0.166620I$<br>$a = 0.25189 + 1.89766I$<br>$b = 0.409310 + 0.451135I$ | $-1.07874 - 2.57674I$ | 0 |
| $u = -0.853017 + 0.633169I$<br>$a = -0.533821 + 0.009715I$<br>$b = -0.1065160 + 0.0398102I$ | $1.77380 + 2.47815I$ | 0 |
| $u = -0.853017 - 0.633169I$<br>$a = -0.533821 - 0.009715I$<br>$b = -0.1065160 - 0.0398102I$ | $1.77380 - 2.47815I$ | 0 |
| $u = -1.067130 + 0.027007I$<br>$a = 2.20309 + 0.64129I$<br>$b = 1.68580 + 0.39940I$ | $-5.25977 + 0.42586I$ | 0 |
| $u = -1.067130 - 0.027007I$<br>$a = 2.20309 - 0.64129I$<br>$b = 1.68580 - 0.39940I$ | $-5.25977 - 0.42586I$ | 0 |
| $u = 1.085050 + 0.040939I$<br>$a = -2.07495 - 0.29647I$<br>$b = -1.99607 + 0.35332I$ | $-7.69423 - 2.11350I$ | 0 |
| $u = 1.085050 - 0.040939I$<br>$a = -2.07495 + 0.29647I$<br>$b = -1.99607 - 0.35332I$ | $-7.69423 + 2.11350I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-1.089270+0.053148I$<br>$a=-2.37201-1.44590I$<br>$b=-1.97109-0.94572I$ | $-6.91666+4.67542I$ | 0 |
| $u=-1.089270-0.053148I$<br>$a=-2.37201+1.44590I$<br>$b=-1.97109+0.94572I$ | $-6.91666-4.67542I$ | 0 |
| $u=1.091240+0.069455I$<br>$a=2.22714+1.29507I$<br>$b=1.93126+0.69834I$ | $-2.30120-5.35216I$ | 0 |
| $u=1.091240-0.069455I$<br>$a=2.22714-1.29507I$<br>$b=1.93126-0.69834I$ | $-2.30120+5.35216I$ | 0 |
| $u=0.606096+0.662511I$<br>$a=-0.798963+0.126546I$<br>$b=0.649948-0.932632I$ | $-0.302081+0.540644I$ | 0 |
| $u=0.606096-0.662511I$<br>$a=-0.798963-0.126546I$<br>$b=0.649948+0.932632I$ | $-0.302081-0.540644I$ | 0 |
| $u=0.511993+0.732368I$<br>$a=0.343675-0.709475I$<br>$b=0.044302+1.277450I$ | $-2.69016+2.77408I$ | 0 |
| $u=0.511993-0.732368I$<br>$a=0.343675+0.709475I$<br>$b=0.044302-1.277450I$ | $-2.69016-2.77408I$ | 0 |
| $u=1.106320+0.068441I$<br>$a=-2.68986-1.37616I$<br>$b=-2.38599-0.90186I$ | $-4.70352-10.84140I$ | 0 |
| $u=1.106320-0.068441I$<br>$a=-2.68986+1.37616I$<br>$b=-2.38599+0.90186I$ | $-4.70352+10.84140I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.842412+0.726529I$<br>$a=-0.178651-0.729133I$<br>$b=\ 0.0579763-0.1150040I$ | $3.07344+0.63735I$ | 0 |
| $u=-0.842412-0.726529I$<br>$a=-0.178651+0.729133I$<br>$b=\ 0.0579763+0.1150040I$ | $3.07344-0.63735I$ | 0 |
| $u=-1.116010+0.016772I$<br>$a=-0.84995-1.85919I$<br>$b=-0.75181-1.51606I$ | $-8.11122-1.30695I$ | 0 |
| $u=-1.116010-0.016772I$<br>$a=-0.84995+1.85919I$<br>$b=-0.75181+1.51606I$ | $-8.11122+1.30695I$ | 0 |
| $u=\ 0.859325+0.712441I$<br>$a=\ 0.75900-2.33832I$<br>$b=\ 3.00650-0.45544I$ | $1.60340-2.72171I$ | 0 |
| $u=\ 0.859325-0.712441I$<br>$a=\ 0.75900+2.33832I$<br>$b=\ 3.00650+0.45544I$ | $1.60340+2.72171I$ | 0 |
| $u=\ 0.823392+0.756871I$<br>$a=\ 0.218483-0.973336I$<br>$b=\ 1.78019-1.08683I$ | $6.43694+4.87550I$ | 0 |
| $u=\ 0.823392-0.756871I$<br>$a=\ 0.218483+0.973336I$<br>$b=\ 1.78019+1.08683I$ | $6.43694-4.87550I$ | 0 |
| $u=\ 0.770289+0.411262I$<br>$a=\ 1.47793-0.96752I$<br>$b=\ 0.440891+0.958529I$ | $-2.10537-2.84140I$ | 0 |
| $u=\ 0.770289-0.411262I$<br>$a=\ 1.47793+0.96752I$<br>$b=\ 0.440891-0.958529I$ | $-2.10537+2.84140I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.841098 + 0.751122I$<br>$a = -0.506788 + 1.209090I$<br>$b = -1.90230 + 0.81017I$ | $8.10016 - 0.78832I$ | 0 |
| $u = 0.841098 - 0.751122I$<br>$a = -0.506788 - 1.209090I$<br>$b = -1.90230 - 0.81017I$ | $8.10016 + 0.78832I$ | 0 |
| $u = -0.876875 + 0.722197I$<br>$a = -0.091761 + 0.802743I$<br>$b = -0.0013840 + 0.0733994I$ | $2.96916 + 4.87835I$ | 0 |
| $u = -0.876875 - 0.722197I$<br>$a = -0.091761 - 0.802743I$<br>$b = -0.0013840 - 0.0733994I$ | $2.96916 - 4.87835I$ | 0 |
| $u = 0.885183 + 0.741783I$<br>$a = -1.39537 + 1.55461I$<br>$b = -2.03510 - 0.19569I$ | $7.96620 - 4.86085I$ | 0 |
| $u = 0.885183 - 0.741783I$<br>$a = -1.39537 - 1.55461I$<br>$b = -2.03510 + 0.19569I$ | $7.96620 + 4.86085I$ | 0 |
| $u = 0.901166 + 0.740058I$<br>$a = 1.66978 - 1.57705I$<br>$b = 1.97824 + 0.55475I$ | $6.20092 - 10.53630I$ | 0 |
| $u = 0.901166 - 0.740058I$<br>$a = 1.66978 + 1.57705I$<br>$b = 1.97824 - 0.55475I$ | $6.20092 + 10.53630I$ | 0 |
| $u = -1.005990 + 0.592232I$<br>$a = 0.167955 + 1.051150I$<br>$b = 0.878165 - 0.601426I$ | $0.848394 + 1.048560I$ | 0 |
| $u = -1.005990 - 0.592232I$<br>$a = 0.167955 - 1.051150I$<br>$b = 0.878165 + 0.601426I$ | $0.848394 - 1.048560I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 1.011120 + 0.612755I$<br>$a = -2.26014 + 0.37543I$<br>$b = -0.99132 - 2.03559I$ | $-3.51458 - 1.68605I$ | 0 |
| $u = 1.011120 - 0.612755I$<br>$a = -2.26014 - 0.37543I$<br>$b = -0.99132 + 2.03559I$ | $-3.51458 + 1.68605I$ | 0 |
| $u = -1.026270 + 0.590666I$<br>$a = -0.53736 - 1.42442I$<br>$b = -1.44389 + 0.79586I$ | $-1.50754 - 4.20851I$ | 0 |
| $u = -1.026270 - 0.590666I$<br>$a = -0.53736 + 1.42442I$<br>$b = -1.44389 - 0.79586I$ | $-1.50754 + 4.20851I$ | 0 |
| $u = -1.012950 + 0.625812I$<br>$a = -0.700288 - 0.186711I$<br>$b = -0.19292 + 1.59502I$ | $-4.11619 + 4.19240I$ | 0 |
| $u = -1.012950 - 0.625812I$<br>$a = -0.700288 + 0.186711I$<br>$b = -0.19292 - 1.59502I$ | $-4.11619 - 4.19240I$ | 0 |
| $u = 1.007840 + 0.644172I$<br>$a = 1.61422 - 0.67239I$<br>$b = 1.06573 + 1.37400I$ | $-1.46823 - 5.66596I$ | 0 |
| $u = 1.007840 - 0.644172I$<br>$a = 1.61422 + 0.67239I$<br>$b = 1.06573 - 1.37400I$ | $-1.46823 + 5.66596I$ | 0 |
| $u = -0.516513 + 0.614538I$<br>$a = 1.61419 + 1.13685I$<br>$b = 0.114440 - 0.378217I$ | $-2.79751 + 0.75492I$ | $-13.18461 - 4.17377I$ |
| $u = -0.516513 - 0.614538I$<br>$a = 1.61419 - 1.13685I$<br>$b = 0.114440 + 0.378217I$ | $-2.79751 - 0.75492I$ | $-13.18461 + 4.17377I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.984760+0.696068I$<br>$a=-1.354280+0.257551I$<br>$b=-0.630888+0.742129I$ | $3.81659+2.30298I$ | 0 |
| $u=-0.984760-0.696068I$<br>$a=-1.354280-0.257551I$<br>$b=-0.630888-0.742129I$ | $3.81659-2.30298I$ | 0 |
| $u=-0.392378+0.674009I$<br>$a=1.55257+0.40077I$<br>$b=-0.903906+0.236031I$ | $0.18178+8.98054I$ | $-11.00021-7.46838I$ |
| $u=-0.392378-0.674009I$<br>$a=1.55257-0.40077I$<br>$b=-0.903906-0.236031I$ | $0.18178-8.98054I$ | $-11.00021+7.46838I$ |
| $u=-1.004500+0.695052I$<br>$a=1.79376+0.08698I$<br>$b=1.12781-1.16810I$ | $4.58233+7.83910I$ | 0 |
| $u=-1.004500-0.695052I$<br>$a=1.79376-0.08698I$<br>$b=1.12781+1.16810I$ | $4.58233-7.83910I$ | 0 |
| $u=1.042120+0.637671I$<br>$a=-1.61249-0.63861I$<br>$b=0.17740-1.77018I$ | $-4.20496-7.99344I$ | 0 |
| $u=1.042120-0.637671I$<br>$a=-1.61249+0.63861I$<br>$b=0.17740+1.77018I$ | $-4.20496+7.99344I$ | 0 |
| $u=1.018180+0.675918I$<br>$a=0.96849-1.49648I$<br>$b=1.68010+0.59427I$ | $-0.84382-6.49823I$ | 0 |
| $u=1.018180-0.675918I$<br>$a=0.96849+1.49648I$<br>$b=1.68010-0.59427I$ | $-0.84382+6.49823I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-1.028310+0.678590I$<br>$a=-2.41921-1.22556I$<br>$b=-2.79352+1.71272I$ | $-3.14095+8.37153I$ | 0 |
| $u=-1.028310-0.678590I$<br>$a=-2.41921+1.22556I$<br>$b=-2.79352-1.71272I$ | $-3.14095-8.37153I$ | 0 |
| $u=1.044270+0.661570I$<br>$a=0.50721+1.38026I$<br>$b=-1.25248+0.85970I$ | $-3.79812-5.32874I$ | 0 |
| $u=1.044270-0.661570I$<br>$a=0.50721-1.38026I$<br>$b=-1.25248-0.85970I$ | $-3.79812+5.32874I$ | 0 |
| $u=1.031540+0.683934I$<br>$a=-0.62182+1.93629I$<br>$b=-2.05487-0.18548I$ | $-2.23392-10.96790I$ | 0 |
| $u=1.031540-0.683934I$<br>$a=-0.62182-1.93629I$<br>$b=-2.05487+0.18548I$ | $-2.23392+10.96790I$ | 0 |
| $u=-1.033220+0.691226I$<br>$a=2.77565+0.66832I$<br>$b=2.07476-2.34471I$ | $2.54734+11.64380I$ | 0 |
| $u=-1.033220-0.691226I$<br>$a=2.77565-0.66832I$<br>$b=2.07476+2.34471I$ | $2.54734-11.64380I$ | 0 |
| $u=0.443432+0.610668I$<br>$a=0.886007-0.667581I$<br>$b=-0.730589+1.052200I$ | $-2.10237-3.12059I$ | $-13.26982+4.81629I$ |
| $u=0.443432-0.610668I$<br>$a=0.886007+0.667581I$<br>$b=-0.730589-1.052200I$ | $-2.10237+3.12059I$ | $-13.26982-4.81629I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-1.040030+0.690804I$<br>$a=-3.04535-0.73216I$<br>$b=-2.19998+2.72089I$ | $0.1621+17.2846I$ | 0 |
| $u=-1.040030-0.690804I$<br>$a=-3.04535+0.73216I$<br>$b=-2.19998-2.72089I$ | $0.1621-17.2846I$ | 0 |
| $u=-0.378402+0.630093I$<br>$a=-1.33629-0.55236I$<br>$b=0.523829-0.380248I$ | $2.41042+3.58130I$ | $-7.69186-3.73533I$ |
| $u=-0.378402-0.630093I$<br>$a=-1.33629+0.55236I$<br>$b=0.523829+0.380248I$ | $2.41042-3.58130I$ | $-7.69186+3.73533I$ |
| $u=-0.658769+0.304586I$<br>$a=2.31140+1.30466I$<br>$b=0.923181+0.133554I$ | $-2.64550+0.77211I$ | $-15.5455-7.3829I$ |
| $u=-0.658769-0.304586I$<br>$a=2.31140-1.30466I$<br>$b=0.923181-0.133554I$ | $-2.64550-0.77211I$ | $-15.5455+7.3829I$ |
| $u=-0.218526+0.537148I$<br>$a=-0.408550-0.675362I$<br>$b=-0.241540-0.913033I$ | $3.54467+0.53496I$ | $-5.34128-2.54226I$ |
| $u=-0.218526-0.537148I$<br>$a=-0.408550+0.675362I$<br>$b=-0.241540+0.913033I$ | $3.54467-0.53496I$ | $-5.34128+2.54226I$ |
| $u=-0.135378+0.544021I$<br>$a=0.020276+0.569777I$<br>$b=0.550133+1.008990I$ | $2.18579-4.67641I$ | $-7.53230+3.53464I$ |
| $u=-0.135378-0.544021I$<br>$a=0.020276-0.569777I$<br>$b=0.550133-1.008990I$ | $2.18579+4.67641I$ | $-7.53230-3.53464I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \ 0.468563$<br>$a = -0.888738$<br>$b = \ 0.195924$ | $-0.660128$ | $-14.9900$ |
| $u = \ 0.240493 + 0.334959I$<br>$a = -1.106550 + 0.760023I$<br>$b = \ 0.648529 - 0.094589I$ | $-0.875975 + 0.268582I$ | $-10.54321 + 1.26230I$ |
| $u = \ 0.240493 - 0.334959I$<br>$a = -1.106550 - 0.760023I$<br>$b = \ 0.648529 + 0.094589I$ | $-0.875975 - 0.268582I$ | $-10.54321 - 1.26230I$ |

**II. $I_2^u = \langle u^7 - u^5 + 2u^3 + b - u + 1,\ u^7 - u^5 + u^4 + 2u^3 - u^2 + a + 2,\ u^8 - u^7 - u^6 + 2u^5 + u^4 - 2u^3 + 2u - 1 \rangle$**

**(i) Arc colorings**

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u^7 + u^5 - u^4 - 2u^3 + u^2 - 2 \\ -u^7 + u^5 - 2u^3 + u - 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^7 + u^5 - u^4 - 2u^3 + u^2 - 2 \\ -u^7 + u^5 - 2u^3 + u - 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^3 \\ u^5 - u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^5 - u \\ -u^7 + u^5 - 2u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^5 + u \\ u^5 - u^3 + u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^5 + u \\ u^7 - u^5 + 2u^3 - u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -u^7 - u^4 - 2u^3 + u^2 - u - 2 \\ -2u^7 + 2u^5 - 4u^3 + 2u - 1 \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= -2u^7 - u^6 + 5u^5 - 5u^3 + u^2 + 4u - 17$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_2$ | $(u-1)^8$ |
| $c_3, c_7$ | $u^8$ |
| $c_4$ | $(u+1)^8$ |
| $c_5, c_8$ | $u^8+u^7-3u^6-2u^5+3u^4+2u-1$ |
| $c_6$ | $u^8-u^7-u^6+2u^5+u^4-2u^3+2u-1$ |
| $c_9$ | $u^8-u^7-3u^6+2u^5+3u^4-2u-1$ |
| $c_{10}$ | $u^8-3u^7+7u^6-10u^5+11u^4-10u^3+6u^2-4u+1$ |
| $c_{11}$ | $u^8+u^7-u^6-2u^5+u^4+2u^3-2u-1$ |
| $c_{12}$ | $u^8+3u^7+7u^6+10u^5+11u^4+10u^3+6u^2+4u+1$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_2, c_4$ | $(y-1)^8$ |
| $c_3, c_7$ | $y^8$ |
| $c_5, c_8, c_9$ | $y^8 - 7y^7 + 19y^6 - 22y^5 + 3y^4 + 14y^3 - 6y^2 - 4y + 1$ |
| $c_6, c_{11}$ | $y^8 - 3y^7 + 7y^6 - 10y^5 + 11y^4 - 10y^3 + 6y^2 - 4y + 1$ |
| $c_{10}, c_{12}$ | $y^8 + 5y^7 + 11y^6 + 6y^5 - 17y^4 - 34y^3 - 22y^2 - 4y + 1$ |

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

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.570868 + 0.730671I$<br>$a = -0.805639 - 0.183365I$<br>$b = 0.320534 - 0.633953I$ | $-2.68559 + 1.13123I$ | $-13.47926 - 0.84929I$ |
| $u = 0.570868 - 0.730671I$<br>$a = -0.805639 + 0.183365I$<br>$b = 0.320534 + 0.633953I$ | $-2.68559 - 1.13123I$ | $-13.47926 + 0.84929I$ |
| $u = -0.855237 + 0.665892I$<br>$a = -0.189481 - 1.310380I$<br>$b = -1.54709 - 0.16160I$ | $0.51448 + 2.57849I$ | $-14.5054 - 3.2330I$ |
| $u = -0.855237 - 0.665892I$<br>$a = -0.189481 + 1.310380I$<br>$b = -1.54709 + 0.16160I$ | $0.51448 - 2.57849I$ | $-14.5054 + 3.2330I$ |
| $u = -1.09818$<br>$a = 0.729394$<br>$b = 0.879647$ | $-8.14766$ | $-19.4520$ |
| $u = 1.031810 + 0.655470I$<br>$a = 0.708845 - 0.169402I$<br>$b = 0.679246 + 0.851242I$ | $-4.02461 - 6.44354I$ | $-15.2754 + 5.9053I$ |
| $u = 1.031810 - 0.655470I$<br>$a = 0.708845 + 0.169402I$<br>$b = 0.679246 - 0.851242I$ | $-4.02461 + 6.44354I$ | $-15.2754 - 5.9053I$ |
| $u = 0.603304$<br>$a = -2.15684$<br>$b = -0.785038$ | $-2.48997$ | $-15.0280$ |

**III. u-Polynomials**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $((u-1)^8)(u^{103}+49u^{102}+\cdots+72u+1)$ |
| $c_2$ | $((u-1)^8)(u^{103}-9u^{102}+\cdots-2u+1)$ |
| $c_3, c_7$ | $u^8(u^{103}+u^{102}+\cdots+896u+256)$ |
| $c_4$ | $((u+1)^8)(u^{103}-9u^{102}+\cdots-2u+1)$ |
| $c_5$ | $(u^8+u^7-3u^6-2u^5+3u^4+2u-1)(u^{103}+2u^{102}+\cdots+126u+9)$ |
| $c_6$ | $(u^8-u^7+\cdots+2u-1)(u^{103}-2u^{102}+\cdots-6u^2+1)$ |
| $c_8$ | $(u^8+u^7-3u^6-2u^5+3u^4+2u-1)$ $\cdot(u^{103}-8u^{102}+\cdots+326018u+52865)$ |
| $c_9$ | $(u^8-u^7-3u^6+2u^5+3u^4-2u-1)(u^{103}+2u^{102}+\cdots+126u+9)$ |
| $c_{10}$ | $(u^8-3u^7+7u^6-10u^5+11u^4-10u^3+6u^2-4u+1)$ $\cdot(u^{103}+36u^{102}+\cdots+12u+1)$ |
| $c_{11}$ | $(u^8+u^7+\cdots-2u-1)(u^{103}-2u^{102}+\cdots-6u^2+1)$ |
| $c_{12}$ | $(u^8+3u^7+7u^6+10u^5+11u^4+10u^3+6u^2+4u+1)$ $\cdot(u^{103}+36u^{102}+\cdots+12u+1)$ |

**IV. Riley Polynomials**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $((y-1)^8)(y^{103}+19y^{102}+\cdots+1672y-1)$ |
| $c_2, c_4$ | $((y-1)^8)(y^{103}-49y^{102}+\cdots+72y-1)$ |
| $c_3, c_7$ | $y^8(y^{103}+51y^{102}+\cdots-1130496y-65536)$ |
| $c_5, c_9$ | $(y^8-7y^7+19y^6-22y^5+3y^4+14y^3-6y^2-4y+1)$ $\cdot(y^{103}-68y^{102}+\cdots-22536y-81)$ |
| $c_6, c_{11}$ | $(y^8-3y^7+7y^6-10y^5+11y^4-10y^3+6y^2-4y+1)$ $\cdot(y^{103}-36y^{102}+\cdots+12y-1)$ |
| $c_8$ | $(y^8-7y^7+19y^6-22y^5+3y^4+14y^3-6y^2-4y+1)$ $\cdot(y^{103}+16y^{102}+\cdots-53970185116y-2794708225)$ |
| $c_{10}, c_{12}$ | $(y^8+5y^7+11y^6+6y^5-17y^4-34y^3-22y^2-4y+1)$ $\cdot(y^{103}+64y^{102}+\cdots-68y-1)$ |