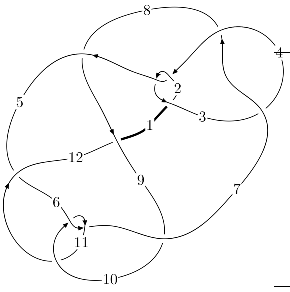
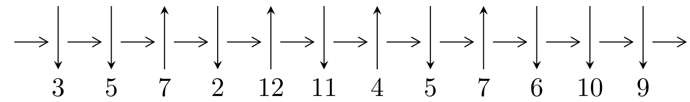
$12n_{0165}$ ($K12n_{0165}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -u^{41} + u^{40} + \cdots + u^2 + b,\ u^{41} - u^{40} + \cdots + a + 2,\ u^{42} - 2u^{41} + \cdots + 2u - 1 \rangle$$
$$I_2^u = \langle u^6 - 2u^4 - u^3 + u^2 + b + u + 1,\ u^7 + u^6 - 2u^5 - 2u^4 + u^3 + u^2 + a + u + 1,$$
$$u^9 + u^8 - 2u^7 - 3u^6 + u^5 + 3u^4 + 2u^3 - u - 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 51 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.

$$\boldsymbol{I_1^u = \langle -u^{41}+u^{40}+\cdots+u^2+b,\ u^{41}-u^{40}+\cdots+a+2,\ u^{42}-2u^{41}+\cdots+2u-1\rangle}$$

(i) Arc colorings

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

$$a_{11} = \begin{pmatrix}0\\u\end{pmatrix}$$

$$a_3 = \begin{pmatrix}-u^{41}+u^{40}+\cdots+2u-2\\u^{41}-u^{40}+\cdots+u^3-u^2\end{pmatrix}$$

$$a_7 = \begin{pmatrix}1\\u^2\end{pmatrix}$$

$$a_4 = \begin{pmatrix}-u^{40}+u^{39}+\cdots+u-1\\-u^{40}+u^{39}+\cdots-2u^2+u\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}u\\u\end{pmatrix}$$

$$a_{12} = \begin{pmatrix}-u^3\\-u^3+u\end{pmatrix}$$

$$a_5 = \begin{pmatrix}u^6-u^4+1\\u^6-2u^4+u^2\end{pmatrix}$$

$$a_2 = \begin{pmatrix}u^{39}-u^{38}+\cdots+u-2\\u^{41}-u^{40}+\cdots+u^3-2u^2\end{pmatrix}$$

$$a_1 = \begin{pmatrix}u^{11}-2u^9+2u^7+u^3\\u^{13}-3u^{11}+5u^9-4u^7+2u^5+u^3-u\end{pmatrix}$$

$$a_9 = \begin{pmatrix}u^3\\u^5-u^3+u\end{pmatrix}$$

$$a_8 = \begin{pmatrix}u^{17}-4u^{15}+7u^{13}-4u^{11}-3u^9+6u^7-2u^5+u\\u^{17}-5u^{15}+11u^{13}-12u^{11}+5u^9+2u^7-2u^5+u\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -6u^{41}+9u^{40}+58u^{39}-101u^{38}-263u^{37}+545u^{36}+691u^{35}-1830u^{34}-1021u^{33}+4173u^{32}+344u^{31}-6595u^{30}+2038u^{29}+6914u^{28}-5159u^{27}-3793u^{26}+6460u^{25}-1008u^{24}-4436u^{23}+3755u^{22}+744u^{21}-2743u^{20}+1497u^{19}+47u^{18}-1234u^{17}+1369u^{16}-10u^{15}-898u^{14}+560u^{13}-14u^{12}-332u^{11}+300u^{10}+6u^9-87u^8+54u^7-69u^6-18u^5+67u^4-23u^3+7u^2+4u-13$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{42} + 6u^{41} + \cdots + 14u + 1$
c_2, c_4	$u^{42} - 10u^{41} + \cdots + 10u - 1$
c_3, c_7	$u^{42} - u^{41} + \cdots + 512u + 512$
c_5, c_9	$u^{42} + 6u^{41} + \cdots - 134u - 17$
c_6, c_{10}	$u^{42} + 2u^{41} + \cdots - 2u - 1$
c_8	$u^{42} + 2u^{41} + \cdots - 2773910u - 699025$
c_{11}	$u^{42} + 22u^{41} + \cdots + 2u + 1$
c_{12}	$u^{42} - 2u^{41} + \cdots + 2u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{42} + 70y^{41} + \cdots - 202y + 1$
c_2, c_4	$y^{42} - 6y^{41} + \cdots - 14y + 1$
c_3, c_7	$y^{42} - 57y^{41} + \cdots - 4718592y + 262144$
c_5, c_9	$y^{42} + 26y^{41} + \cdots - 9490y + 289$
c_6, c_{10}	$y^{42} - 22y^{41} + \cdots - 2y + 1$
c_8	$y^{42} + 90y^{41} + \cdots - 6627902285450y + 488635950625$
c_{11}	$y^{42} - 2y^{41} + \cdots - 22y + 1$
c_{12}	$y^{42} + 54y^{41} + \cdots - 2y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.758535 + 0.646533I$ $a = 0.556695 + 1.198170I$ $b = 0.884685 + 1.037480I$	$11.73740 + 1.53247I$	$0.138999 + 0.820904I$
$u = 0.758535 - 0.646533I$ $a = 0.556695 - 1.198170I$ $b = 0.884685 - 1.037480I$	$11.73740 - 1.53247I$	$0.138999 - 0.820904I$
$u = -0.850409 + 0.511409I$ $a = 0.510882 + 0.992064I$ $b = 0.224665 + 0.371706I$	$1.85125 + 3.14547I$	$0.50380 - 5.60471I$
$u = -0.850409 - 0.511409I$ $a = 0.510882 - 0.992064I$ $b = 0.224665 - 0.371706I$	$1.85125 - 3.14547I$	$0.50380 + 5.60471I$
$u = 0.799944 + 0.638230I$ $a = -0.94309 - 1.79340I$ $b = -0.338330 - 1.002640I$	$11.61710 - 6.48369I$	$-0.21200 + 5.34025I$
$u = 0.799944 - 0.638230I$ $a = -0.94309 + 1.79340I$ $b = -0.338330 + 1.002640I$	$11.61710 + 6.48369I$	$-0.21200 - 5.34025I$
$u = 0.894592$ $a = 1.03594$ $b = 0.336424$	-1.45839	-6.12070
$u = -0.674270 + 0.529870I$ $a = 0.671399 - 0.395254I$ $b = 0.627556 + 0.015747I$	$2.36371 + 1.10219I$	$2.10234 - 2.56596I$
$u = -0.674270 - 0.529870I$ $a = 0.671399 + 0.395254I$ $b = 0.627556 - 0.015747I$	$2.36371 - 1.10219I$	$2.10234 + 2.56596I$
$u = 0.229875 + 0.814047I$ $a = -0.318800 + 1.227780I$ $b = -2.11276 - 1.36196I$	$8.65210 + 8.20700I$	$-1.50156 - 4.22989I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.229875 - 0.814047I$ $a = -0.318800 - 1.227780I$ $b = -2.11276 + 1.36196I$	$8.65210 - 8.20700I$	$-1.50156 + 4.22989I$
$u = 0.265629 + 0.793421I$ $a = 0.226149 - 0.606330I$ $b = 2.08149 + 0.30188I$	$9.24719 + 0.37833I$	$-0.624670 + 0.106792I$
$u = 0.265629 - 0.793421I$ $a = 0.226149 + 0.606330I$ $b = 2.08149 - 0.30188I$	$9.24719 - 0.37833I$	$-0.624670 - 0.106792I$
$u = 1.104060 + 0.374333I$ $a = 0.75446 + 1.54813I$ $b = -0.75382 + 1.34478I$	$-2.74442 - 1.12803I$	$-6.06477 - 0.07417I$
$u = 1.104060 - 0.374333I$ $a = 0.75446 - 1.54813I$ $b = -0.75382 - 1.34478I$	$-2.74442 + 1.12803I$	$-6.06477 + 0.07417I$
$u = -1.129850 + 0.429601I$ $a = 0.69978 - 2.03550I$ $b = -0.45833 - 2.41418I$	$-5.34146 + 2.73778I$	$-7.76940 - 4.35221I$
$u = -1.129850 - 0.429601I$ $a = 0.69978 + 2.03550I$ $b = -0.45833 + 2.41418I$	$-5.34146 - 2.73778I$	$-7.76940 + 4.35221I$
$u = -1.178670 + 0.271644I$ $a = 2.19851 + 0.72892I$ $b = 1.52165 - 0.58407I$	$4.73543 + 2.88234I$	$-5.97327 - 2.64287I$
$u = -1.178670 - 0.271644I$ $a = 2.19851 - 0.72892I$ $b = 1.52165 + 0.58407I$	$4.73543 - 2.88234I$	$-5.97327 + 2.64287I$
$u = -0.117108 + 0.770698I$ $a = 0.612360 - 0.464938I$ $b = -1.219860 + 0.084521I$	$-1.15293 - 3.18904I$	$-1.05779 + 4.41031I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.117108 - 0.770698I$ $a = 0.612360 + 0.464938I$ $b = -1.219860 - 0.084521I$	$-1.15293 + 3.18904I$	$-1.05779 - 4.41031I$
$u = 1.135850 + 0.467533I$ $a = -0.617308 - 1.067990I$ $b = 1.12086 - 1.09303I$	$-5.06407 - 5.10089I$	$-8.06417 + 3.90479I$
$u = 1.135850 - 0.467533I$ $a = -0.617308 + 1.067990I$ $b = 1.12086 + 1.09303I$	$-5.06407 + 5.10089I$	$-8.06417 - 3.90479I$
$u = -1.203160 + 0.305558I$ $a = -2.23809 + 0.67343I$ $b = -0.75733 + 2.10032I$	$4.19530 - 4.64476I$	$-6.50760 + 1.85624I$
$u = -1.203160 - 0.305558I$ $a = -2.23809 - 0.67343I$ $b = -0.75733 - 2.10032I$	$4.19530 + 4.64476I$	$-6.50760 - 1.85624I$
$u = -1.132780 + 0.508544I$ $a = -0.90981 + 1.95883I$ $b = 0.74904 + 2.04170I$	$-1.76893 + 6.56054I$	$-3.91539 - 6.62369I$
$u = -1.132780 - 0.508544I$ $a = -0.90981 - 1.95883I$ $b = 0.74904 - 2.04170I$	$-1.76893 - 6.56054I$	$-3.91539 + 6.62369I$
$u = 1.192020 + 0.396256I$ $a = -1.338870 + 0.229283I$ $b = -1.18542 - 1.02127I$	$-4.97897 - 0.77808I$	$-5.12685 - 0.91316I$
$u = 1.192020 - 0.396256I$ $a = -1.338870 - 0.229283I$ $b = -1.18542 + 1.02127I$	$-4.97897 + 0.77808I$	$-5.12685 + 0.91316I$
$u = 0.680819 + 0.286111I$ $a = 0.32342 + 1.54495I$ $b = -0.624981 + 0.021795I$	$-1.21863 - 1.30834I$	$-6.02556 + 4.39977I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.680819 - 0.286111I$ $a = 0.32342 - 1.54495I$ $b = -0.624981 - 0.021795I$	$-1.21863 + 1.30834I$	$-6.02556 - 4.39977I$
$u = 1.154970 + 0.552374I$ $a = 1.32333 - 2.31600I$ $b = 2.34332 - 0.76541I$	$6.62233 - 5.39094I$	$-3.64487 + 3.52784I$
$u = 1.154970 - 0.552374I$ $a = 1.32333 + 2.31600I$ $b = 2.34332 + 0.76541I$	$6.62233 + 5.39094I$	$-3.64487 - 3.52784I$
$u = -1.186050 + 0.496366I$ $a = -1.24916 - 1.10553I$ $b = -1.95101 + 0.16201I$	$-4.27225 + 7.86289I$	$-4.24616 - 7.85401I$
$u = -1.186050 - 0.496366I$ $a = -1.24916 + 1.10553I$ $b = -1.95101 - 0.16201I$	$-4.27225 - 7.86289I$	$-4.24616 + 7.85401I$
$u = -0.229937 + 0.670128I$ $a = 0.500950 + 0.538105I$ $b = 0.526961 - 1.227640I$	$0.81664 - 2.02421I$	$-0.01141 + 3.23458I$
$u = -0.229937 - 0.670128I$ $a = 0.500950 - 0.538105I$ $b = 0.526961 + 1.227640I$	$0.81664 + 2.02421I$	$-0.01141 - 3.23458I$
$u = 1.173930 + 0.546675I$ $a = -0.61187 + 3.18910I$ $b = -2.91661 + 2.11720I$	$5.8554 - 13.2425I$	$-4.63609 + 7.63130I$
$u = 1.173930 - 0.546675I$ $a = -0.61187 - 3.18910I$ $b = -2.91661 - 2.11720I$	$5.8554 + 13.2425I$	$-4.63609 - 7.63130I$
$u = -0.657519$ $a = -2.62357$ $b = -1.65716$	-2.37590	1.74590

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \quad 0.088074 + 0.595763I$ $a = -0.85711 - 1.31323I$ $b = -0.101404 + 0.925885I$	$-2.22400 + 0.97106I$	$-5.17623 + 0.64972I$
$u = \quad 0.088074 - 0.595763I$ $a = -0.85711 + 1.31323I$ $b = -0.101404 - 0.925885I$	$-2.22400 - 0.97106I$	$-5.17623 - 0.64972I$

II. $\boldsymbol{I_2^u = \langle u^6 - 2u^4 - u^3 + u^2 + b + u + 1,\ u^7 + u^6 - 2u^5 - 2u^4 + u^3 + u^2 + a + u + 1,\ u^9 + u^8 - 2u^7 - 3u^6 + u^5 + 3u^4 + 2u^3 - u - 1\rangle}$

(i) Arc colorings

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

$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^7 - u^6 + 2u^5 + 2u^4 - u^3 - u^2 - u - 1 \\ -u^6 + 2u^4 + u^3 - u^2 - u - 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^7 - u^6 + 2u^5 + 2u^4 - u^3 - u^2 - u - 1 \\ -u^6 + 2u^4 + u^3 - u^2 - u - 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -u^3 \\ -u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^6 - u^4 + 1 \\ u^6 - 2u^4 + u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^7 - 2u^6 + 2u^5 + 3u^4 - u^3 - u^2 - u - 2 \\ -2u^6 + 4u^4 + u^3 - 2u^2 - u - 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^6 + u^4 - 1 \\ -u^6 + 2u^4 - u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^3 \\ u^5 - u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -u^8 - 6u^7 + u^6 + 12u^5 + 5u^4 - 10u^3 - 7u^2 - 7u - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u-1)^9$
c_3, c_7	u^9
c_4	$(u+1)^9$
c_5	$u^9+3u^8+8u^7+13u^6+17u^5+17u^4+12u^3+6u^2+u-1$
c_6	$u^9+u^8-2u^7-3u^6+u^5+3u^4+2u^3-u-1$
c_8, c_{12}	$u^9-u^8+2u^7-u^6+3u^5-u^4+2u^3+u+1$
c_9	$u^9-3u^8+8u^7-13u^6+17u^5-17u^4+12u^3-6u^2+u+1$
c_{10}	$u^9-u^8-2u^7+3u^6+u^5-3u^4+2u^3-u+1$
c_{11}	$u^9+5u^8+12u^7+15u^6+9u^5-u^4-4u^3-2u^2+u+1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^9$
c_3, c_7	y^9
c_5, c_9	$y^9 + 7y^8 + 20y^7 + 25y^6 + 5y^5 - 15y^4 + 22y^2 + 13y - 1$
c_6, c_{10}	$y^9 - 5y^8 + 12y^7 - 15y^6 + 9y^5 + y^4 - 4y^3 + 2y^2 + y - 1$
c_8, c_{12}	$y^9 + 3y^8 + 8y^7 + 13y^6 + 17y^5 + 17y^4 + 12y^3 + 6y^2 + y - 1$
c_{11}	$y^9 - y^8 + 12y^7 - 7y^6 + 37y^5 + y^4 - 10y^2 + 5y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.772920 + 0.510351I$ $a = -0.147032 - 1.012940I$ $b = -0.848670 - 0.225310I$	$0.13850 + 2.09337I$	$-1.56547 - 4.18932I$
$u = -0.772920 - 0.510351I$ $a = -0.147032 + 1.012940I$ $b = -0.848670 + 0.225310I$	$0.13850 - 2.09337I$	$-1.56547 + 4.18932I$
$u = 0.825933$ $a = -1.95176$ $b = -1.33142$	-2.84338	-16.7240
$u = 1.173910 + 0.391555I$ $a = 0.679689 + 0.626017I$ $b = 0.25695 + 1.39155I$	$-6.01628 - 1.33617I$	$-11.45029 + 1.01794I$
$u = 1.173910 - 0.391555I$ $a = 0.679689 - 0.626017I$ $b = 0.25695 - 1.39155I$	$-6.01628 + 1.33617I$	$-11.45029 - 1.01794I$
$u = -0.141484 + 0.739668I$ $a = -0.541407 + 0.753907I$ $b = 0.443165 - 0.284059I$	$-2.26187 - 2.45442I$	$-5.68179 + 2.62939I$
$u = -0.141484 - 0.739668I$ $a = -0.541407 - 0.753907I$ $b = 0.443165 + 0.284059I$	$-2.26187 + 2.45442I$	$-5.68179 - 2.62939I$
$u = -1.172470 + 0.500383I$ $a = 0.484630 + 0.655708I$ $b = 1.314260 + 0.168567I$	$-5.24306 + 7.08493I$	$-8.94033 - 5.11095I$
$u = -1.172470 - 0.500383I$ $a = 0.484630 - 0.655708I$ $b = 1.314260 - 0.168567I$	$-5.24306 - 7.08493I$	$-8.94033 + 5.11095I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^9)(u^{42}+6u^{41}+\cdots+14u+1)$
c_2	$((u-1)^9)(u^{42}-10u^{41}+\cdots+10u-1)$
c_3, c_7	$u^9(u^{42}-u^{41}+\cdots+512u+512)$
c_4	$((u+1)^9)(u^{42}-10u^{41}+\cdots+10u-1)$
c_5	$(u^9+3u^8+8u^7+13u^6+17u^5+17u^4+12u^3+6u^2+u-1)$ $\cdot(u^{42}+6u^{41}+\cdots-134u-17)$
c_6	$(u^9+u^8+\cdots-u-1)(u^{42}+2u^{41}+\cdots-2u-1)$
c_8	$(u^9-u^8+2u^7-u^6+3u^5-u^4+2u^3+u+1)$ $\cdot(u^{42}+2u^{41}+\cdots-2773910u-699025)$
c_9	$(u^9-3u^8+8u^7-13u^6+17u^5-17u^4+12u^3-6u^2+u+1)$ $\cdot(u^{42}+6u^{41}+\cdots-134u-17)$
c_{10}	$(u^9-u^8+\cdots-u+1)(u^{42}+2u^{41}+\cdots-2u-1)$
c_{11}	$(u^9+5u^8+12u^7+15u^6+9u^5-u^4-4u^3-2u^2+u+1)$ $\cdot(u^{42}+22u^{41}+\cdots+2u+1)$
c_{12}	$(u^9-u^8+\cdots+u+1)(u^{42}-2u^{41}+\cdots+2u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^9)(y^{42}+70y^{41}+\cdots-202y+1)$
c_2, c_4	$((y-1)^9)(y^{42}-6y^{41}+\cdots-14y+1)$
c_3, c_7	$y^9(y^{42}-57y^{41}+\cdots-4718592y+262144)$
c_5, c_9	$(y^9+7y^8+20y^7+25y^6+5y^5-15y^4+22y^2+13y-1)$ $\cdot(y^{42}+26y^{41}+\cdots-9490y+289)$
c_6, c_{10}	$(y^9-5y^8+12y^7-15y^6+9y^5+y^4-4y^3+2y^2+y-1)$ $\cdot(y^{42}-22y^{41}+\cdots-2y+1)$
c_8	$(y^9+3y^8+8y^7+13y^6+17y^5+17y^4+12y^3+6y^2+y-1)$ $\cdot(y^{42}+90y^{41}+\cdots-6627902285450y+488635950625)$
c_{11}	$(y^9-y^8+12y^7-7y^6+37y^5+y^4-10y^2+5y-1)$ $\cdot(y^{42}-2y^{41}+\cdots-22y+1)$
c_{12}	$(y^9+3y^8+8y^7+13y^6+17y^5+17y^4+12y^3+6y^2+y-1)$ $\cdot(y^{42}+54y^{41}+\cdots-2y+1)$