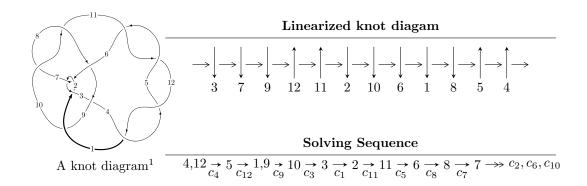
# $12a_{0612} \ (K12a_{0612})$



#### Ideals for irreducible components<sup>2</sup> of $X_{par}$

$$I_1^u = \langle -2.18462 \times 10^{73} u^{73} + 3.16063 \times 10^{73} u^{72} + \dots + 5.40007 \times 10^{73} b - 3.24788 \times 10^{72}, \\ -2.10222 \times 10^{73} u^{73} - 1.17709 \times 10^{73} u^{72} + \dots + 2.16003 \times 10^{74} a - 7.97915 \times 10^{74}, \ u^{74} - 2u^{73} + \dots - 5u - 10^{74} u^{74} + 10^{74} u^{74} u^$$

\* 2 irreducible components of  $\dim_{\mathbb{C}} = 0$ , with total 76 representations.

<sup>&</sup>lt;sup>1</sup>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).

<sup>&</sup>lt;sup>2</sup> All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

$$I. \\ I_1^u = \langle -2.18 \times 10^{73} u^{73} + 3.16 \times 10^{73} u^{72} + \dots + 5.40 \times 10^{73} b - 3.25 \times 10^{72}, \ -2.10 \times 10^{73} u^{73} - 1.18 \times 10^{73} u^{72} + \dots + 2.16 \times 10^{74} a - 7.98 \times 10^{74}, \ u^{74} - 2u^{73} + \dots - 5u + 1 \rangle$$

(i) Arc colorings

$$a_{4} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_{5} = \begin{pmatrix} 1 \\ -u^{2} \end{pmatrix}$$

$$a_{1} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_{9} = \begin{pmatrix} 0.0973237u^{73} + 0.0544942u^{72} + \dots - 7.75879u + 3.69400 \\ 0.404554u^{73} - 0.585294u^{72} + \dots + 2.13148u + 0.0601452 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.0724192u^{73} + 0.00246463u^{72} + \dots - 7.32492u + 3.66868 \\ 0.379649u^{73} - 0.637323u^{72} + \dots + 2.56535u + 0.0348175 \end{pmatrix}$$

$$a_{3} = \begin{pmatrix} 1.52542u^{73} - 2.53855u^{72} + \dots + 1.82716u - 0.738325 \\ 0.550001u^{73} - 0.984294u^{72} + \dots + 1.31434u - 0.000117455 \end{pmatrix}$$

$$a_{2} = \begin{pmatrix} -1.45206u^{73} + 3.42469u^{72} + \dots + 9.87487u + 1.52722 \\ -0.301071u^{73} + 0.447914u^{72} + \dots + 0.617849u - 0.0822885 \end{pmatrix}$$

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

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

$$a_{8} = \begin{pmatrix} 0.317026u^{73} + 0.923011u^{72} + \dots - 6.65577u + 3.92960 \\ 0.433026u^{73} - 1.09679u^{72} + \dots + 4.34853u - 0.519695 \end{pmatrix}$$

$$a_{7} = \begin{pmatrix} -0.512410u^{73} + 1.28277u^{72} + \dots + 1.89759u + 0.211662 \\ 0.0303919u^{73} - 0.875961u^{72} + \dots + 5.08662u - 1.26747 \end{pmatrix}$$

- (ii) Obstruction class = -1
- (iii) Cusp Shapes =  $6.42891u^{73} 17.1405u^{72} + \cdots + 84.2991u 27.4117$

## (iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1$	$u^{74} + 30u^{73} + \dots + 11u + 1$
$c_2, c_6$	$u^{74} - 2u^{73} + \dots + u + 1$
<i>c</i> <sub>3</sub>	$u^{74} - u^{73} + \dots + 32u - 64$
$c_4, c_5, c_{11}$ $c_{12}$	$u^{74} + 2u^{73} + \dots + 5u + 1$
$c_7, c_{10}$	$u^{74} - 3u^{73} + \dots - 24u - 16$
$c_8$	$4(4u^{74} + 50u^{73} + \dots + 1.01760 \times 10^7 u - 826861)$
$c_9$	$4(4u^{74} + 74u^{73} + \dots + 3578u + 331)$

## (v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1$	$y^{74} + 22y^{73} + \dots - 11y + 1$
$c_2, c_6$	$y^{74} - 30y^{73} + \dots - 11y + 1$
<i>c</i> <sub>3</sub>	$y^{74} - 15y^{73} + \dots - 100864y + 4096$
$c_4, c_5, c_{11}$ $c_{12}$	$y^{74} + 90y^{73} + \dots - 11y + 1$
$c_7, c_{10}$	$y^{74} - 57y^{73} + \dots + 8928y + 256$
$c_8$	$16(16y^{74} - 988y^{73} + \dots - 3.20264 \times 10^{13}y + 6.83699 \times 10^{11})$
$c_9$	$16(16y^{74} - 12y^{73} + \dots - 4095460y + 109561)$

## (vi) Complex Volumes and Cusp Shapes

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 0.516398 + 0.937796I		
a = 1.37934 + 0.47440I	-5.3318 + 13.4301I	0
b = 1.11519 - 1.02621I		
u = 0.516398 - 0.937796I		
a = 1.37934 - 0.47440I	-5.3318 - 13.4301I	0
b = 1.11519 + 1.02621I		
u = 0.646355 + 0.860532I		
a = -0.031559 + 0.651495I	-4.52765 - 4.39825I	0
b = 0.787715 + 0.427271I		
u = 0.646355 - 0.860532I		
a = -0.031559 - 0.651495I	-4.52765 + 4.39825I	0
b = 0.787715 - 0.427271I		
u = -0.514593 + 0.957275I		
a = -1.203500 + 0.319270I	-3.14453 - 7.64245I	0
b = -0.931893 - 0.901069I		
u = -0.514593 - 0.957275I		
a = -1.203500 - 0.319270I	-3.14453 + 7.64245I	0
b = -0.931893 + 0.901069I		
u = -0.164439 + 1.088400I		
a = -0.289406 - 0.798790I	-0.76278 - 2.78369I	0
b = 0.007352 - 0.649980I		
u = -0.164439 - 1.088400I		
a = -0.289406 + 0.798790I	-0.76278 + 2.78369I	0
b = 0.007352 + 0.649980I		
u = 0.565708 + 0.953078I		
a = 0.797027 + 0.611956I	-9.49521 + 4.75713I	0
b = 1.083310 - 0.435515I		
u = 0.565708 - 0.953078I		
a = 0.797027 - 0.611956I	-9.49521 - 4.75713I	0
b = 1.083310 + 0.435515I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = -0.139200 + 0.868293I		
a = 1.067450 - 0.566161I	-5.34190 - 5.03781I	0
b = 1.41905 - 1.07046I		
u = -0.139200 - 0.868293I		
a = 1.067450 + 0.566161I	-5.34190 + 5.03781I	0
b = 1.41905 + 1.07046I		
u = -0.053293 + 0.873796I		
a = 0.463556 - 0.288559I	-6.12072 + 1.15020I	0
b = 0.57959 - 1.54839I		
u = -0.053293 - 0.873796I		
a = 0.463556 + 0.288559I	-6.12072 - 1.15020I	0
b = 0.57959 + 1.54839I		
u = 0.339838 + 0.799583I		
a = -1.61362 - 0.26065I	-0.75369 + 7.61744I	0
b = -1.24870 + 1.11169I		
u = 0.339838 - 0.799583I		
a = -1.61362 + 0.26065I	-0.75369 - 7.61744I	0
b = -1.24870 - 1.11169I		
u = 0.857154		
a = 0.267986	-6.54255	-13.9400
b = -0.915149		
u = -0.352195 + 0.760005I		
a = 1.41551 - 0.20271I	0.71510 - 2.68070I	0
b = 0.886656 + 1.011220I		
u = -0.352195 - 0.760005I		
a = 1.41551 + 0.20271I	0.71510 + 2.68070I	0
b = 0.886656 - 1.011220I		
u = -0.809015 + 0.119912I		
a = -0.063657 - 0.319788I	0.12891 - 3.27306I	0. + 6.36577I
b = 0.625904 + 0.637596I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = -0.809015 - 0.119912I		
a = -0.063657 + 0.319788I	0.12891 + 3.27306I	06.36577I
b = 0.625904 - 0.637596I		
u = 0.229003 + 0.780373I		
a = -1.50737 - 0.57430I	-3.53186 + 1.82003I	-12.85757 + 0.I
b = -1.213480 + 0.110904I		
u = 0.229003 - 0.780373I		
a = -1.50737 + 0.57430I	-3.53186 - 1.82003I	-12.85757 + 0.I
b = -1.213480 - 0.110904I		
u = 0.116450 + 0.799438I		
a = -1.337450 - 0.093652I	-3.46518 + 1.28856I	-10.13108 + 0.I
b = -0.844614 - 0.673886I		
u = 0.116450 - 0.799438I		
a = -1.337450 + 0.093652I	-3.46518 - 1.28856I	-10.13108 + 0.I
b = -0.844614 + 0.673886I		
u = -0.732025 + 0.956216I		
a = -0.160761 + 0.324928I	-2.08683 - 1.93469I	0
b = -0.525729 + 0.071221I		
u = -0.732025 - 0.956216I		
a = -0.160761 - 0.324928I	-2.08683 + 1.93469I	0
b = -0.525729 - 0.071221I		
u = 0.782596 + 0.075119I		
a = 0.210771 - 0.453706I	-2.24768 + 9.11251I	-6.74714 - 7.64665I
b = -0.903700 + 0.805460I		
u = 0.782596 - 0.075119I		
a = 0.210771 + 0.453706I	-2.24768 - 9.11251I	-6.74714 + 7.64665I
b = -0.903700 - 0.805460I		
u = 0.157717 + 0.755447I		
a = -0.07570 - 1.57177I	-1.00910 - 2.34681I	-6.98279 + 1.27218I
b = -0.364346 - 0.324652I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 0.157717 - 0.755447I		
a = -0.07570 + 1.57177I	-1.00910 + 2.34681I	-6.98279 - 1.27218I
b = -0.364346 + 0.324652I		
u = -0.315752 + 0.567010I		
a = 0.726247 - 0.417162I	-0.095251 - 1.249930I	-1.34438 + 5.11849I
b = 0.265687 + 0.485420I		
u = -0.315752 - 0.567010I		
a = 0.726247 + 0.417162I	-0.095251 + 1.249930I	-1.34438 - 5.11849I
b = 0.265687 - 0.485420I		
u = 0.120112 + 0.600674I		
a = -4.25050 - 3.90612I	-2.57143 + 1.88701I	-22.8777 - 20.8815I
b = -0.378236 + 0.135229I		
u = 0.120112 - 0.600674I		
a = -4.25050 + 3.90612I	-2.57143 - 1.88701I	-22.8777 + 20.8815I
b = -0.378236 - 0.135229I		
u = -0.525480 + 0.097303I		
a = 0.694323 - 0.276907I	2.69534 - 0.34676I	2.07291 + 1.95664I
b = -0.448154 + 0.890040I		
u = -0.525480 - 0.097303I		
a = 0.694323 + 0.276907I	2.69534 + 0.34676I	2.07291 - 1.95664I
b = -0.448154 - 0.890040I		
u = 0.508981 + 0.034990I		
a = -0.944097 - 0.159201I	1.52983 - 4.69247I	-0.63478 + 4.64507I
b = 0.768623 + 0.882121I		
u = 0.508981 - 0.034990I		
a = -0.944097 + 0.159201I	1.52983 + 4.69247I	-0.63478 - 4.64507I
b = 0.768623 - 0.882121I		
u = -0.06618 + 1.61043I		
a = -1.103590 - 0.029524I	-7.73703 - 2.51040I	0
b = -0.610671 - 0.632639I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = -0.06618 - 1.61043I		
a = -1.103590 + 0.029524I	-7.73703 + 2.51040I	0
b = -0.610671 + 0.632639I		
u = 0.03509 + 1.61351I		
a = 0.888518 + 0.804947I	-9.06255 - 1.74034I	0
b = 0.456223 - 0.165796I		
u = 0.03509 - 1.61351I		
a = 0.888518 - 0.804947I	-9.06255 + 1.74034I	0
b = 0.456223 + 0.165796I		
u = 0.00915 + 1.62932I		
a = 3.65614 - 2.49513I	-10.53390 + 2.15468I	0
b = 0.235207 + 0.261485I		
u = 0.00915 - 1.62932I		
a = 3.65614 + 2.49513I	-10.53390 - 2.15468I	0
b = 0.235207 - 0.261485I		
u = -0.162962 + 0.325759I		
a = 0.37499 - 5.29235I	-2.74823 + 1.72250I	2.01945 - 1.32528I
b = -0.061683 + 0.638217I		
u = -0.162962 - 0.325759I		
a = 0.37499 + 5.29235I	-2.74823 - 1.72250I	2.01945 + 1.32528I
b = -0.061683 - 0.638217I		
u = -0.307838 + 0.186179I		
a = 0.36310 - 3.03306I	-2.23234 - 3.57955I	-4.32988 + 5.24615I
b = -0.728206 + 0.583603I		
u = -0.307838 - 0.186179I		
a = 0.36310 + 3.03306I	-2.23234 + 3.57955I	-4.32988 - 5.24615I
b = -0.728206 - 0.583603I		
u = -0.08246 + 1.64390I		
a = -1.79296 - 0.55515I	-7.63678 - 4.24546I	0
b = -1.26542 - 1.17285I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = -0.08246 - 1.64390I	7 62670 + 4 245461	0
a = -1.79296 + 0.55515I $b = -1.26542 + 1.17285I$	-7.63678 + 4.24546I	0
$\frac{b = -1.20342 + 1.17283I}{u = 0.05737 + 1.65209I}$		
a = 2.06972 + 0.11611I	-12.05210 + 2.87915I	0
b = 1.64431 - 0.28908I		
u = 0.05737 - 1.65209I		
a = 2.06972 - 0.11611I	-12.05210 - 2.87915I	0
b = 1.64431 + 0.28908I		
u = 0.08286 + 1.65467I		
a = 2.11845 - 0.66031I	-9.30194 + 9.17519I	0
b = 1.64239 - 1.35516I		
u = 0.08286 - 1.65467I		
a = 2.11845 + 0.66031I	-9.30194 - 9.17519I	0
b = 1.64239 + 1.35516I		
u = 0.02506 + 1.66126I		
a = 1.51899 + 0.63274I	-12.15050 + 1.78914I	0
b = 1.15850 + 1.07316I		
u = 0.02506 - 1.66126I		
a = 1.51899 - 0.63274I	-12.15050 - 1.78914I	0
b = 1.15850 - 1.07316I		
u = 0.331439 + 0.062097I		
a = 0.042259 - 1.155080I	-1.180990 - 0.117604I	-4.18793 - 0.25289I
b = 0.772329 + 0.069502I		
u = 0.331439 - 0.062097I		
a = 0.042259 + 1.155080I	-1.180990 + 0.117604I	-4.18793 + 0.25289I
b = 0.772329 - 0.069502I		
u = -0.03137 + 1.67412I		
a = -1.88894 + 1.15601I	-14.3020 - 5.6642I	0
b = -1.88611 + 1.43903I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = -0.03137 - 1.67412I		
a = -1.88894 - 1.15601I	-14.3020 + 5.6642I	0
b = -1.88611 - 1.43903I		
u = -0.01286 + 1.67510I		
a = -0.86416 + 1.39905I	-15.1137 + 0.9015I	0
b = -0.84742 + 2.08208I		
u = -0.01286 - 1.67510I		
a = -0.86416 - 1.39905I	-15.1137 - 0.9015I	0
b = -0.84742 - 2.08208I		
u = 0.14686 + 1.69181I		
a = -1.85665 + 0.23574I	-14.4226 + 16.0595I	0
b = -1.30389 + 1.18234I		
u = 0.14686 - 1.69181I		
a = -1.85665 - 0.23574I	-14.4226 - 16.0595I	0
b = -1.30389 - 1.18234I		
u = -0.14591 + 1.69645I		
a = 1.68010 + 0.24966I	-12.3248 - 10.2734I	0
b = 1.17315 + 1.05919I		
u = -0.14591 - 1.69645I		
a = 1.68010 - 0.24966I	-12.3248 + 10.2734I	0
b = 1.17315 - 1.05919I		
u = 0.15685 + 1.69894I		
a = -1.54459 - 0.10686I	-18.6532 + 7.6097I	0
b = -1.33263 + 0.70962I		
u = 0.15685 - 1.69894I		
a = -1.54459 + 0.10686I	-18.6532 - 7.6097I	0
b = -1.33263 - 0.70962I		
u = 0.19047 + 1.71554I		
a = -0.819798 - 0.305915I	-13.42310 - 0.97072I	0
b = -0.900938 + 0.096382I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 0.19047 - 1.71554I		
a = -0.819798 + 0.305915I	-13.42310 + 0.97072I	0
b = -0.900938 - 0.096382I		
u = -0.16188 + 1.72459I		
a = 1.005060 + 0.026326I	-11.56300 - 5.35029I	0
b = 0.852608 + 0.458742I		
u = -0.16188 - 1.72459I		
a = 1.005060 - 0.026326I	-11.56300 + 5.35029I	0
b = 0.852608 - 0.458742I		
u = 0.261116		
a = 1.48550	-1.16884	-7.32880
b = 0.559178		

II. 
$$I_2^u=\langle b,\; 2a+1,\; u^2-u+1\rangle$$

(i) Arc colorings

a) Are colorings
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.5 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -\frac{1}{2}u \\ -\frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} -u \\ u-1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u \\ -u+2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} \frac{1}{2}u \\ -\frac{3}{2}u + \frac{3}{2} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ -u+1 \end{pmatrix}$$

- (ii) Obstruction class = 1
- (iii) Cusp Shapes =  $-4u \frac{7}{4}$

## (iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1, c_6, c_{11} \\ c_{12}$	$u^2 + u + 1$
$c_2, c_4, c_5$	$u^2 - u + 1$
$c_3$	$u^2$
c <sub>7</sub>	$(u-1)^2$
c <sub>8</sub>	$4(4u^2 + 6u + 3)$
<i>c</i> 9	$4(4u^2 + 2u + 1)$
$c_{10}$	$(u+1)^2$

# (v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1, c_2, c_4 \\ c_5, c_6, c_{11} \\ c_{12}$	$y^2 + y + 1$
$c_3$	$y^2$
$c_7,c_{10}$	$(y-1)^2$
<i>C</i> <sub>8</sub>	$16(16y^2 - 12y + 9)$
<i>C</i> 9	$16(16y^2 + 4y + 1)$

# (vi) Complex Volumes and Cusp Shapes

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 0.500000 + 0.866025I		
a = -0.500000	-1.64493 + 2.02988I	-3.75000 - 3.46410I
b = 0		
u = 0.500000 - 0.866025I		
a = -0.500000	-1.64493 - 2.02988I	-3.75000 + 3.46410I
b = 0		

## III. u-Polynomials

Crossings	u-Polynomials at each crossing
$c_1$	$ (u^2 + u + 1)(u^{74} + 30u^{73} + \dots + 11u + 1) $
$c_2$	$(u^2 - u + 1)(u^{74} - 2u^{73} + \dots + u + 1)$
$c_3$	$u^2(u^{74} - u^{73} + \dots + 32u - 64)$
$c_4,c_5$	$(u^2 - u + 1)(u^{74} + 2u^{73} + \dots + 5u + 1)$
$c_6$	$(u^2 + u + 1)(u^{74} - 2u^{73} + \dots + u + 1)$
	$((u-1)^2)(u^{74} - 3u^{73} + \dots - 24u - 16)$
<i>C</i> <sub>8</sub>	$16(4u^2 + 6u + 3)(4u^{74} + 50u^{73} + \dots + 1.01760 \times 10^7 u - 826861)$
<i>C</i> 9	$16(4u^2 + 2u + 1)(4u^{74} + 74u^{73} + \dots + 3578u + 331)$
$c_{10}$	$((u+1)^2)(u^{74} - 3u^{73} + \dots - 24u - 16)$
$c_{11}, c_{12}$	$(u^2 + u + 1)(u^{74} + 2u^{73} + \dots + 5u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing	
$c_1$	$(y^2 + y + 1)(y^{74} + 22y^{73} + \dots - 11y + 1)$	
$c_2, c_6$	$(y^2 + y + 1)(y^{74} - 30y^{73} + \dots - 11y + 1)$	
$c_3$	$y^2(y^{74} - 15y^{73} + \dots - 100864y + 4096)$	
$c_4, c_5, c_{11}$ $c_{12}$	$(y^2 + y + 1)(y^{74} + 90y^{73} + \dots - 11y + 1)$	
$c_7, c_{10}$	$((y-1)^2)(y^{74} - 57y^{73} + \dots + 8928y + 256)$	
$c_8$	$256(16y^2 - 12y + 9)$ $\cdot (16y^{74} - 988y^{73} + \dots - 32026352041720y + 683699113321)$	
$c_9$	$256(16y^2 + 4y + 1)(16y^{74} - 12y^{73} + \dots - 4095460y + 109561)$	