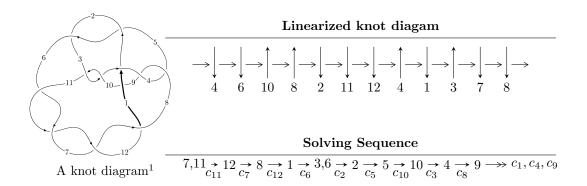
# $12n_{0793} (K12n_{0793})$



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

$$\begin{split} I_1^u &= \langle -9.06380 \times 10^{25} u^{41} + 1.37425 \times 10^{28} u^{40} + \dots + 2.41942 \times 10^{28} b - 1.11983 \times 10^{29}, \\ &- 3.26749 \times 10^{28} u^{41} - 3.64396 \times 10^{28} u^{40} + \dots + 2.66137 \times 10^{29} a + 8.28132 \times 10^{29}, \\ &u^{42} + 2u^{41} + \dots - 46u + 11 \rangle \\ I_2^u &= \langle u^7 - 5u^5 + 7u^3 + b - 2u, \ u^7 - 5u^5 + 7u^3 - u^2 + a - 2u + 2, \\ &u^{12} + u^{11} - 8u^{10} - 7u^9 + 24u^8 + 17u^7 - 33u^6 - 16u^5 + 20u^4 + 4u^3 - 4u^2 - u - 1 \rangle \end{split}$$

\* 2 irreducible components of  $\dim_{\mathbb{C}} = 0$ , with total 54 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).

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

I. 
$$I_1^u = \langle -9.06 \times 10^{25} u^{41} + 1.37 \times 10^{28} u^{40} + \cdots + 2.42 \times 10^{28} b - 1.12 \times 10^{29}, \ -3.27 \times 10^{28} u^{41} - 3.64 \times 10^{28} u^{40} + \cdots + 2.66 \times 10^{29} a + 8.28 \times 10^{29}, \ u^{42} + 2u^{41} + \cdots - 46u + 11 \rangle$$

(i) Arc colorings

$$a_{7} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ u^{2} \end{pmatrix}$$

$$a_{8} = \begin{pmatrix} -u \\ -u^{3} + u \end{pmatrix}$$

$$a_{1} = \begin{pmatrix} 0.122775u^{41} + 0.136921u^{40} + \dots + 9.26541u - 3.11168 \\ 0.00374626u^{41} - 0.568007u^{40} + \dots - 19.2584u + 4.62848 \end{pmatrix}$$

$$a_{6} = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_{2} = \begin{pmatrix} 0.552701u^{41} + 0.271165u^{40} + \dots - 10.9013u + 2.02390 \\ 0.433672u^{41} - 0.433763u^{40} + \dots - 39.4251u + 9.76406 \end{pmatrix}$$

$$a_{5} = \begin{pmatrix} 1.16210u^{41} + 1.69216u^{40} + \dots + 6.54468u - 3.34003 \\ 0.919505u^{41} + 0.221580u^{40} + \dots + 40.9514u + 10.5711 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1.17084u^{41} + 1.34160u^{40} + \dots - 4.55540u - 2.12767 \\ 1.14646u^{41} + 1.21035u^{40} + \dots - 7.23546u - 2.71408 \end{pmatrix}$$

$$a_{4} = \begin{pmatrix} 0.785947u^{41} + 1.09699u^{40} + \dots + 0.412589u - 1.16966 \\ 0.634717u^{41} + 0.515957u^{40} + \dots - 23.4534u + 6.67222 \end{pmatrix}$$

$$a_{9} = \begin{pmatrix} -1.45613u^{41} - 1.65616u^{40} + \dots + 6.43111u + 2.36059 \\ -1.31980u^{41} - 1.39650u^{40} + \dots + 8.42549u + 3.12293 \end{pmatrix}$$

- (ii) Obstruction class = -1
- (iii) Cusp Shapes =  $0.0586366u^{41} + 0.331503u^{40} + \cdots + 5.71695u 17.0612$

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

Crossings	u-Polynomials at each crossing
$c_1$	$u^{42} - 2u^{41} + \dots - 45u - 1$
$c_2, c_5$	$u^{42} + 3u^{41} + \dots + 3244u + 611$
$c_3, c_{10}$	$u^{42} + u^{41} + \dots - 26u + 7$
$c_4, c_8$	$u^{42} - 3u^{41} + \dots + 222u + 79$
$c_6, c_7, c_{11}$ $c_{12}$	$u^{42} - 2u^{41} + \dots + 46u + 11$
<i>C</i> 9	$u^{42} + u^{41} + \dots - 48u + 1$

## (v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1$	$y^{42} + 34y^{41} + \dots - 3015y + 1$
$c_2, c_5$	$y^{42} - 29y^{41} + \dots - 6104784y + 373321$
$c_3, c_{10}$	$y^{42} + 43y^{41} + \dots - 1208y + 49$
$c_4, c_8$	$y^{42} - 37y^{41} + \dots - 146770y + 6241$
$c_6, c_7, c_{11}$ $c_{12}$	$y^{42} - 52y^{41} + \dots - 2050y + 121$
<i>c</i> 9	$y^{42} + 39y^{41} + \dots - 3522y + 1$

## (vi) Complex Volumes and Cusp Shapes

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 0.221678 + 0.929619I		
a = 0.236802 + 0.144006I	-0.23479 + 3.42452I	-7.25006 - 2.36788I
b = 0.200628 + 1.379120I		
u = 0.221678 - 0.929619I		
a = 0.236802 - 0.144006I	-0.23479 - 3.42452I	-7.25006 + 2.36788I
b = 0.200628 - 1.379120I		
u = 0.834678 + 0.726650I		
a = 0.942471 + 1.038720I	-2.09585 - 8.88492I	-8.23343 + 6.33839I
b = -0.32235 + 1.47004I		
u = 0.834678 - 0.726650I		
a = 0.942471 - 1.038720I	-2.09585 + 8.88492I	-8.23343 - 6.33839I
b = -0.32235 - 1.47004I		
u = 0.839481		
a = -0.147245	-1.61731	-3.83040
b = 0.446812		
u = -0.649459 + 0.528735I		
a = 0.425369 - 0.221209I	3.71527 + 4.57178I	-4.48983 - 6.21438I
b = -0.883358 - 0.331381I		
u = -0.649459 - 0.528735I		
a = 0.425369 + 0.221209I	3.71527 - 4.57178I	-4.48983 + 6.21438I
b = -0.883358 + 0.331381I		
u = -1.205320 + 0.086480I		
a = -0.45359 + 1.35560I	-4.64795 + 1.97026I	-11.59090 - 3.85800I
b = 0.093741 + 0.991733I		
u = -1.205320 - 0.086480I		
a = -0.45359 - 1.35560I	-4.64795 - 1.97026I	-11.59090 + 3.85800I
b = 0.093741 - 0.991733I		
u = 0.550462 + 0.540915I		
a = -1.409400 - 0.043470I	-6.87451 - 1.88626I	-7.91284 + 3.72193I
b = 0.125351 - 1.359680I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 0.550462 - 0.540915I		
a = -1.409400 + 0.043470I	-6.87451 + 1.88626I	-7.91284 - 3.72193I
b = 0.125351 + 1.359680I		
u = -0.560203 + 0.440638I		
a = 1.43565 - 1.00821I	-7.60002 + 1.56574I	-5.17924 - 4.63604I
b = -0.04993 - 1.58808I		
u = -0.560203 - 0.440638I		
a = 1.43565 + 1.00821I	-7.60002 - 1.56574I	-5.17924 + 4.63604I
b = -0.04993 + 1.58808I		
u = -0.334964 + 0.627307I		
a = -0.026307 + 1.176530I	4.67940 - 0.63289I	-1.299354 - 0.211342I
b = 0.577071 - 0.144380I		
u = -0.334964 - 0.627307I		
a = -0.026307 - 1.176530I	4.67940 + 0.63289I	-1.299354 + 0.211342I
b = 0.577071 + 0.144380I		
u = -1.244160 + 0.465780I		
a = -0.79090 + 1.18454I	-4.81553 + 1.49702I	0
b = -0.025737 + 1.302660I		
u = -1.244160 - 0.465780I		
a = -0.79090 - 1.18454I	-4.81553 - 1.49702I	0
b = -0.025737 - 1.302660I		
u = 0.595320 + 0.215476I		
a = 0.20407 - 3.29680I	1.45303 - 2.42211I	-8.67176 + 3.95905I
b = 0.272977 - 1.203760I		
u = 0.595320 - 0.215476I		
a = 0.20407 + 3.29680I	1.45303 + 2.42211I	-8.67176 - 3.95905I
b = 0.272977 + 1.203760I		
u = 1.42044 + 0.21754I		
a = -0.455901 + 0.764179I	-0.93890 - 2.37365I	0
b = -0.205009 + 0.109418I		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 1.42044 - 0.21754I		
a = -0.455901 - 0.764179I	-0.93890 + 2.37365I	0
b = -0.205009 - 0.109418I		
u = 0.509507 + 0.231007I		
a = 0.734692 - 0.787767I	1.69283 + 0.80157I	-9.60902 + 2.15996I
b = -0.636452 - 1.034150I		
u = 0.509507 - 0.231007I		
a = 0.734692 + 0.787767I	1.69283 - 0.80157I	-9.60902 - 2.15996I
b = -0.636452 + 1.034150I		
u = -0.506114		
a = -1.86988	-2.40722	5.24600
b = 0.407424		
u = -1.56067 + 0.05190I		
a = 0.204618 - 1.091020I	-5.42360 + 0.16996I	0
b = 0.907751 - 0.996705I		
u = -1.56067 - 0.05190I		
a = 0.204618 + 1.091020I	-5.42360 - 0.16996I	0
b = 0.907751 + 0.996705I		
u = 1.56797		
a = 0.157767	-9.60649	0
b = -0.854086		
u = -1.58059 + 0.15570I		
a = 0.76812 - 1.50303I	-14.1195 + 4.4084I	0
b = -0.36026 - 1.39238I		
u = -1.58059 - 0.15570I		
a = 0.76812 + 1.50303I	-14.1195 - 4.4084I	0
b = -0.36026 + 1.39238I		
u = 1.58699 + 0.12206I		
a = -0.62381 - 2.20399I	-14.9835 - 3.5968I	0
b = 0.15580 - 1.70095I		

$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
-14.9835 + 3.5968I	0
-6.19779 + 3.44957I	0
-6.19779 - 3.44957I	0
-3.89460 - 7.04306I	0
-3.89460 + 7.04306I	0
-0.234295 - 0.833962I	-5.60412 + 8.29990I
-0.234295 + 0.833962I	-5.60412 - 8.29990I
-10.5286 + 12.5719I	0
-10.5286 - 12.5719I	0
-10.7530	0
	-14.9835 + 3.5968I $-6.19779 + 3.44957I$ $-6.19779 - 3.44957I$ $-3.89460 - 7.04306I$ $-3.89460 + 7.04306I$ $-0.234295 - 0.833962I$ $-0.234295 + 0.833962I$ $-10.5286 + 12.5719I$ $-10.5286 - 12.5719I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 1.75180 + 0.08364I		
a = 0.43693 + 1.85011I	-15.4551 - 3.4434I	0
b = -0.26084 + 1.40596I		
u = 1.75180 - 0.08364I		
a = 0.43693 - 1.85011I	-15.4551 + 3.4434I	0
b = -0.26084 - 1.40596I		

II. 
$$I_2^u = \langle u^7 - 5u^5 + 7u^3 + b - 2u, u^7 - 5u^5 + 7u^3 - u^2 + a - 2u + 2, u^{12} + u^{11} + \dots - u - 1 \rangle$$

(i) Arc colorings

$$a_{7} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ u^{2} \end{pmatrix}$$

$$a_{8} = \begin{pmatrix} -u \\ -u^{3} + u \end{pmatrix}$$

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

$$a_{3} = \begin{pmatrix} -u^{7} + 5u^{5} - 7u^{3} + u^{2} + 2u - 2 \\ -u^{7} + 5u^{5} - 7u^{3} + 2u \end{pmatrix}$$

$$a_{6} = \begin{pmatrix} u \\ u \end{pmatrix}$$

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

$$a_{5} = \begin{pmatrix} -u^{10} + 7u^{8} - u^{7} - 17u^{6} + 5u^{5} + 16u^{4} - 8u^{3} - 4u^{2} + 5u \\ -u^{10} + 7u^{8} - u^{7} - 17u^{6} + 4u^{5} + 16u^{4} - 4u^{3} - 4u^{2} + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^{9} + 7u^{7} - 17u^{5} + 17u^{3} - 6u \\ u^{3} - 2u - 1 \end{pmatrix}$$

$$a_{4} = \begin{pmatrix} -u^{10} + 7u^{8} - u^{7} - 17u^{6} + 6u^{5} + 16u^{4} - 11u^{3} - 4u^{2} + 6u \\ -u^{10} + 7u^{8} - 17u^{6} + 16u^{4} - 4u^{2} \end{pmatrix}$$

$$a_{9} = \begin{pmatrix} u^{11} - 9u^{9} + 30u^{7} - 45u^{5} + 30u^{3} - 9u - 1 \\ -u - 1 \end{pmatrix}$$

- (ii) Obstruction class = 1
- (iii) Cusp Shapes =  $-u^{11} + 6u^9 + u^8 10u^7 10u^6 u^5 + 29u^4 + 10u^3 27u^2 + u 7u^8 10u^8 10u^8$

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

Crossings	u-Polynomials at each crossing
$c_1$	$u^{12} - u^{11} + 3u^{10} + u^8 + 3u^7 - 2u^6 - u^5 - u^4 - 4u^3 - u^2 + 2u + 1$
$c_2$	$u^{12} + 2u^{11} - u^{10} - 4u^9 - u^8 - u^7 - 2u^6 + 3u^5 + u^4 + 3u^2 - u + 1$
<i>C</i> 3	$u^{12} + 7u^{10} + 19u^8 - u^7 + 25u^6 - 4u^5 + 16u^4 - 5u^3 + 3u^2 - 3u - 1$
C4	$u^{12} - 2u^{11} - u^{10} + 4u^9 - 3u^8 + 4u^7 - 7u^5 + 4u^4 - 7u^3 + 8u^2 + 3u - 1$
<i>C</i> 5	$u^{12} - 2u^{11} - u^{10} + 4u^9 - u^8 + u^7 - 2u^6 - 3u^5 + u^4 + 3u^2 + u + 1$
$c_{6}, c_{7}$	$u^{12} - u^{11} + \dots + u - 1$
<i>C</i> <sub>8</sub>	$u^{12} + 2u^{11} - u^{10} - 4u^9 - 3u^8 - 4u^7 + 7u^5 + 4u^4 + 7u^3 + 8u^2 - 3u - 1$
<i>C</i> 9	$u^{12} + 3u^{10} - u^9 - 2u^7 - 8u^6 + 7u^5 - 4u^4 + 15u^3 + 4u^2 + u - 3$
$c_{10}$	$u^{12} + 7u^{10} + 19u^8 + u^7 + 25u^6 + 4u^5 + 16u^4 + 5u^3 + 3u^2 + 3u - 1$
$c_{11}, c_{12}$	$u^{12} + u^{11} + \dots - u - 1$

## (v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1$	$y^{12} + 5y^{11} + \dots - 6y + 1$
$c_2, c_5$	$y^{12} - 6y^{11} + \dots + 5y + 1$
$c_3, c_{10}$	$y^{12} + 14y^{11} + \dots - 15y + 1$
$c_4, c_8$	$y^{12} - 6y^{11} + \dots - 25y + 1$
$c_6, c_7, c_{11}$ $c_{12}$	$y^{12} - 17y^{11} + \dots + 7y + 1$
<i>C</i> 9	$y^{12} + 6y^{11} + \dots - 25y + 9$

## (vi) Complex Volumes and Cusp Shapes

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = 0.686882 + 0.356361I		
a = -1.57192 - 1.03304I	-8.42506 - 1.23513I	-14.9695 + 0.5232I
b = 0.08327 - 1.52260I		
u = 0.686882 - 0.356361I		
a = -1.57192 + 1.03304I	-8.42506 + 1.23513I	-14.9695 - 0.5232I
b = 0.08327 + 1.52260I		
u = -0.697854		
a = -1.27667	-2.77397	-17.7110
b = 0.236332		
u = -1.350010 + 0.165727I		
a = 0.122773 + 0.422338I	-1.87314 + 3.35889I	-9.63200 - 3.88261I
b = 0.327726 + 0.869804I		
u = -1.350010 - 0.165727I		
a = 0.122773 - 0.422338I	-1.87314 - 3.35889I	-9.63200 + 3.88261I
b = 0.327726 - 0.869804I		
u = 1.43456 + 0.19655I		
a = 0.38745 + 1.66784I	-2.74104 - 0.62345I	-7.00640 - 0.32990I
b = 0.368130 + 1.103920I		
u = 1.43456 - 0.19655I		
a = 0.38745 - 1.66784I	-2.74104 + 0.62345I	-7.00640 + 0.32990I
b = 0.368130 - 1.103920I		
u = -0.076876 + 0.352057I		
a = -2.49621 + 0.92625I	2.45499 - 1.46473I	-3.28668 + 1.82890I
b = -0.378175 + 0.980375I		
u = -0.076876 - 0.352057I		
a = -2.49621 - 0.92625I	2.45499 + 1.46473I	-3.28668 - 1.82890I
b = -0.378175 - 0.980375I		
u = 1.67252		
a = 0.219784	-11.3408	-16.0060
b = -0.577555		

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
u = -1.68189 + 0.10991I		
a = 0.58634 - 1.91439I	-16.9020 + 3.1092I	-14.7470 - 0.9268I
b = -0.23034 - 1.54467I		
u = -1.68189 - 0.10991I		
a = 0.58634 + 1.91439I	-16.9020 - 3.1092I	-14.7470 + 0.9268I
b = -0.23034 + 1.54467I		

#### III. u-Polynomials

Crossings	u-Polynomials at each crossing
$c_1$	$(u^{12} - u^{11} + 3u^{10} + u^8 + 3u^7 - 2u^6 - u^5 - u^4 - 4u^3 - u^2 + 2u + 1)$ $\cdot (u^{42} - 2u^{41} + \dots - 45u - 1)$
$c_2$	$(u^{12} + 2u^{11} - u^{10} - 4u^9 - u^8 - u^7 - 2u^6 + 3u^5 + u^4 + 3u^2 - u + 1)$ $\cdot (u^{42} + 3u^{41} + \dots + 3244u + 611)$
$c_3$	$(u^{12} + 7u^{10} + 19u^8 - u^7 + 25u^6 - 4u^5 + 16u^4 - 5u^3 + 3u^2 - 3u - 1)$ $\cdot (u^{42} + u^{41} + \dots - 26u + 7)$
$c_4$	$(u^{12} - 2u^{11} - u^{10} + 4u^9 - 3u^8 + 4u^7 - 7u^5 + 4u^4 - 7u^3 + 8u^2 + 3u - 1)$ $\cdot (u^{42} - 3u^{41} + \dots + 222u + 79)$
$c_5$	$(u^{12} - 2u^{11} - u^{10} + 4u^9 - u^8 + u^7 - 2u^6 - 3u^5 + u^4 + 3u^2 + u + 1)$ $\cdot (u^{42} + 3u^{41} + \dots + 3244u + 611)$
$c_6, c_7$	$(u^{12} - u^{11} + \dots + u - 1)(u^{42} - 2u^{41} + \dots + 46u + 11)$
c <sub>8</sub>	$(u^{12} + 2u^{11} - u^{10} - 4u^9 - 3u^8 - 4u^7 + 7u^5 + 4u^4 + 7u^3 + 8u^2 - 3u - 1)$ $\cdot (u^{42} - 3u^{41} + \dots + 222u + 79)$
<i>c</i> <sub>9</sub>	$(u^{12} + 3u^{10} - u^9 - 2u^7 - 8u^6 + 7u^5 - 4u^4 + 15u^3 + 4u^2 + u - 3)$ $\cdot (u^{42} + u^{41} + \dots - 48u + 1)$
$c_{10}$	$(u^{12} + 7u^{10} + 19u^8 + u^7 + 25u^6 + 4u^5 + 16u^4 + 5u^3 + 3u^2 + 3u - 1)$ $\cdot (u^{42} + u^{41} + \dots - 26u + 7)$
$c_{11}, c_{12}$	$(u^{12} + u^{11} + \dots - u - 1)(u^{42} - 2u^{41} + \dots + 46u + 11)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
$c_1$	$(y^{12} + 5y^{11} + \dots - 6y + 1)(y^{42} + 34y^{41} + \dots - 3015y + 1)$
$c_2, c_5$	$(y^{12} - 6y^{11} + \dots + 5y + 1)(y^{42} - 29y^{41} + \dots - 6104784y + 373321)$
$c_3, c_{10}$	$(y^{12} + 14y^{11} + \dots - 15y + 1)(y^{42} + 43y^{41} + \dots - 1208y + 49)$
$c_4, c_8$	$(y^{12} - 6y^{11} + \dots - 25y + 1)(y^{42} - 37y^{41} + \dots - 146770y + 6241)$
$c_6, c_7, c_{11}$ $c_{12}$	$(y^{12} - 17y^{11} + \dots + 7y + 1)(y^{42} - 52y^{41} + \dots - 2050y + 121)$
<i>c</i> 9	$(y^{12} + 6y^{11} + \dots - 25y + 9)(y^{42} + 39y^{41} + \dots - 3522y + 1)$