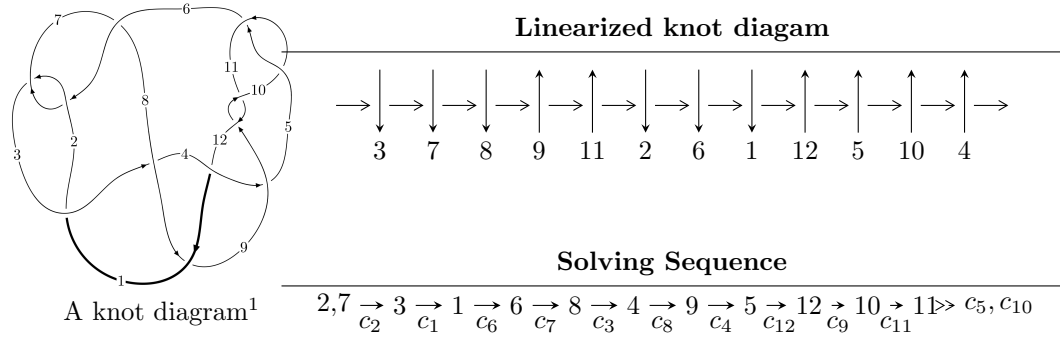


12a<sub>0510</sub> (K12a<sub>0510</sub>)



**Ideals for irreducible components<sup>2</sup> of  $X_{\text{par}}$**

$$I_1^u = \langle u^{96} - u^{95} + \dots - 2u + 1 \rangle$$

\* 1 irreducible components of  $\dim_{\mathbb{C}} = 0$ , with total 96 representations.

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<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.

$$\text{I. } I_1^u = \langle u^{96} - u^{95} + \dots - 2u + 1 \rangle$$

(i) Arc colorings

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

$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

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

$$a_8 = \begin{pmatrix} -u^3 \\ -u^3 + u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^8 + u^6 - u^4 + 1 \\ -u^8 + 2u^6 - 2u^4 + 2u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^9 + 2u^7 - 3u^5 + 2u^3 - u \\ -u^{11} + u^9 - 2u^7 + u^5 - u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^{28} - 5u^{26} + \dots + u^2 + 1 \\ u^{30} - 4u^{28} + \dots - 2u^4 + u^2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} u^{20} - 3u^{18} + 7u^{16} - 10u^{14} + 10u^{12} - 7u^{10} + u^8 + 2u^6 - 3u^4 + u^2 + 1 \\ u^{20} - 4u^{18} + 10u^{16} - 18u^{14} + 23u^{12} - 24u^{10} + 18u^8 - 10u^6 + 3u^4 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^{51} + 8u^{49} + \dots - 6u^5 + 3u^3 \\ -u^{51} + 9u^{49} + \dots - u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^{82} - 13u^{80} + \dots + u^2 + 1 \\ u^{82} - 14u^{80} + \dots + 2u^4 + u^2 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes =  $4u^{94} - 60u^{92} + \dots - 4u^3 + 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1, c_7$	$u^{96} + 31u^{95} + \dots - 4u^2 + 1$
$c_2, c_6$	$u^{96} - u^{95} + \dots - 2u + 1$
$c_3$	$u^{96} + u^{95} + \dots - 16u + 1$
$c_4$	$u^{96} - u^{95} + \dots + 16u + 1$
$c_5, c_{10}$	$u^{96} + u^{95} + \dots + 2u + 1$
$c_8$	$u^{96} - 7u^{95} + \dots - 71328u + 6545$
$c_9, c_{11}$	$u^{96} - 31u^{95} + \dots - 4u^2 + 1$
$c_{12}$	$u^{96} + 7u^{95} + \dots + 71328u + 6545$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1, c_7, c_9$ $c_{11}$	$y^{96} + 69y^{95} + \dots - 8y + 1$
$c_2, c_5, c_6$ $c_{10}$	$y^{96} - 31y^{95} + \dots - 4y^2 + 1$
$c_3, c_4$	$y^{96} - 3y^{95} + \dots + 32y + 1$
$c_8, c_{12}$	$y^{96} + 25y^{95} + \dots + 1210281936y + 42837025$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.668621 + 0.743484I$	$-1.66618 - 3.03949I$	0
$u = 0.668621 - 0.743484I$	$-1.66618 + 3.03949I$	0
$u = -0.671467 + 0.758961I$	$-2.04180 - 2.66465I$	0
$u = -0.671467 - 0.758961I$	$-2.04180 + 2.66465I$	0
$u = 0.838636 + 0.518053I$	$1.78716 + 0.07371I$	0
$u = 0.838636 - 0.518053I$	$1.78716 - 0.07371I$	0
$u = 1.022380 + 0.120604I$	$-3.68776 - 3.29743I$	0
$u = 1.022380 - 0.120604I$	$-3.68776 + 3.29743I$	0
$u = -0.956778 + 0.147180I$	$-1.78716 + 0.07371I$	0
$u = -0.956778 - 0.147180I$	$-1.78716 - 0.07371I$	0
$u = -1.029200 + 0.147717I$	$5.56148I$	0
$u = -1.029200 - 0.147717I$	$-5.56148I$	0
$u = -1.042110 + 0.066897I$	$-7.33598 - 3.27045I$	0
$u = -1.042110 - 0.066897I$	$-7.33598 + 3.27045I$	0
$u = 1.042500 + 0.077924I$	$-7.84437 - 2.48794I$	0
$u = 1.042500 - 0.077924I$	$-7.84437 + 2.48794I$	0
$u = 0.928290 + 0.486480I$	$-3.57263 + 5.11647I$	0
$u = 0.928290 - 0.486480I$	$-3.57263 - 5.11647I$	0
$u = -0.929772 + 0.502774I$	$-4.38563 + 0.62113I$	0
$u = -0.929772 - 0.502774I$	$-4.38563 - 0.62113I$	0
$u = -0.700212 + 0.794099I$	$2.47685 - 3.08229I$	0
$u = -0.700212 - 0.794099I$	$2.47685 + 3.08229I$	0
$u = 1.050030 + 0.136772I$	$-6.42062 - 5.30599I$	0
$u = 1.050030 - 0.136772I$	$-6.42062 + 5.30599I$	0
$u = -1.051930 + 0.143074I$	$-5.49564 + 11.08280I$	0
$u = -1.051930 - 0.143074I$	$-5.49564 - 11.08280I$	0
$u = -0.687870 + 0.811992I$	$-5.27036I$	0
$u = -0.687870 - 0.811992I$	$5.27036I$	0
$u = -0.930368 + 0.072614I$	$-1.83592 + 0.18281I$	0
$u = -0.930368 - 0.072614I$	$-1.83592 - 0.18281I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.689278 + 0.816429I$	$0.98870 + 11.03430I$	0
$u = 0.689278 - 0.816429I$	$0.98870 - 11.03430I$	0
$u = 0.702443 + 0.810718I$	$6.42062 + 5.30599I$	0
$u = 0.702443 - 0.810718I$	$6.42062 - 5.30599I$	0
$u = -0.912613 + 0.567303I$	$-1.31450 + 2.17183I$	0
$u = -0.912613 - 0.567303I$	$-1.31450 - 2.17183I$	0
$u = 0.724039 + 0.796746I$	$4.38563 - 0.62113I$	0
$u = 0.724039 - 0.796746I$	$4.38563 + 0.62113I$	0
$u = 0.895137 + 0.209877I$	$-1.29372 - 4.71443I$	$0. + 7.32005I$
$u = 0.895137 - 0.209877I$	$-1.29372 + 4.71443I$	$0. - 7.32005I$
$u = 0.762641 + 0.766889I$	$3.60402 - 0.95351I$	0
$u = 0.762641 - 0.766889I$	$3.60402 + 0.95351I$	0
$u = -0.757759 + 0.793359I$	$4.92325 - 3.35595I$	0
$u = -0.757759 - 0.793359I$	$4.92325 + 3.35595I$	0
$u = -0.784352 + 0.786872I$	$7.84437 + 2.48794I$	0
$u = -0.784352 - 0.786872I$	$7.84437 - 2.48794I$	0
$u = 0.805888 + 0.773211I$	$2.04180 - 2.66465I$	0
$u = 0.805888 - 0.773211I$	$2.04180 + 2.66465I$	0
$u = 0.931057 + 0.621319I$	$1.29372 - 4.71443I$	0
$u = 0.931057 - 0.621319I$	$1.29372 + 4.71443I$	0
$u = -0.806863 + 0.783033I$	$3.03143 + 8.19865I$	0
$u = -0.806863 - 0.783033I$	$3.03143 - 8.19865I$	0
$u = -0.965059 + 0.582350I$	$-4.92325 + 3.35595I$	0
$u = -0.965059 - 0.582350I$	$-4.92325 - 3.35595I$	0
$u = 0.970481 + 0.590990I$	$-4.27532 - 9.11947I$	0
$u = 0.970481 - 0.590990I$	$-4.27532 + 9.11947I$	0
$u = 0.927246 + 0.736499I$	$1.66618 - 3.03949I$	0
$u = 0.927246 - 0.736499I$	$1.66618 + 3.03949I$	0
$u = -0.930480 + 0.745778I$	$2.64953 - 2.43631I$	0
$u = -0.930480 - 0.745778I$	$2.64953 + 2.43631I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.960357 + 0.720758I$	$2.99795 - 4.68596I$	0
$u = 0.960357 - 0.720758I$	$2.99795 + 4.68596I$	0
$u = -0.949669 + 0.740584I$	$7.33598 + 3.27045I$	0
$u = -0.949669 - 0.740584I$	$7.33598 - 3.27045I$	0
$u = 1.000010 + 0.689675I$	$-2.64953 - 2.43631I$	0
$u = 1.000010 - 0.689675I$	$-2.64953 + 2.43631I$	0
$u = -0.969451 + 0.736227I$	$4.27532 + 9.11947I$	0
$u = -0.969451 - 0.736227I$	$4.27532 - 9.11947I$	0
$u = -1.003060 + 0.695382I$	$-3.03143 + 8.19865I$	0
$u = -1.003060 - 0.695382I$	$-3.03143 - 8.19865I$	0
$u = 0.990447 + 0.725417I$	$3.57263 - 5.11647I$	0
$u = 0.990447 - 0.725417I$	$3.57263 + 5.11647I$	0
$u = -1.001950 + 0.717439I$	$1.56141 + 8.78593I$	0
$u = -1.001950 - 0.717439I$	$1.56141 - 8.78593I$	0
$u = 1.006230 + 0.725835I$	$5.49564 - 11.08280I$	0
$u = 1.006230 - 0.725835I$	$5.49564 + 11.08280I$	0
$u = -1.013330 + 0.721341I$	$-0.98870 + 11.03430I$	0
$u = -1.013330 - 0.721341I$	$-0.98870 - 11.03430I$	0
$u = 1.014320 + 0.723773I$	$-16.8186I$	0
$u = 1.014320 - 0.723773I$	$16.8186I$	0
$u = 0.620290 + 0.330583I$	$1.83592 + 0.18281I$	$4.09090 + 0.35926I$
$u = 0.620290 - 0.330583I$	$1.83592 - 0.18281I$	$4.09090 - 0.35926I$
$u = 0.403567 + 0.535727I$	$-2.99795 + 4.68596I$	$-1.17578 - 2.89466I$
$u = 0.403567 - 0.535727I$	$-2.99795 - 4.68596I$	$-1.17578 + 2.89466I$
$u = 0.178894 + 0.615558I$	$-1.56141 - 8.78593I$	$1.86370 + 7.76605I$
$u = 0.178894 - 0.615558I$	$-1.56141 + 8.78593I$	$1.86370 - 7.76605I$
$u = -0.361565 + 0.528636I$	$-3.60402 + 0.95351I$	$-2.43173 - 2.83056I$
$u = -0.361565 - 0.528636I$	$-3.60402 - 0.95351I$	$-2.43173 + 2.83056I$
$u = -0.189386 + 0.603096I$	$-2.47685 + 3.08229I$	$0.00392 - 2.94226I$
$u = -0.189386 - 0.603096I$	$-2.47685 - 3.08229I$	$0.00392 + 2.94226I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.136116 + 0.585368I$	$3.68776 - 3.29743I$	$8.17885 + 5.01878I$
$u = 0.136116 - 0.585368I$	$3.68776 + 3.29743I$	$8.17885 - 5.01878I$
$u = 0.043930 + 0.554399I$	$1.31450 + 2.17183I$	$6.03910 - 2.53826I$
$u = 0.043930 - 0.554399I$	$1.31450 - 2.17183I$	$6.03910 + 2.53826I$
$u = -0.167581 + 0.505886I$	$1.37910I$	$0. - 4.67220I$
$u = -0.167581 - 0.505886I$	$-1.37910I$	$0. + 4.67220I$



## II. u-Polynomials

Crossings	u-Polynomials at each crossing
$c_1, c_7$	$u^{96} + 31u^{95} + \dots - 4u^2 + 1$
$c_2, c_6$	$u^{96} - u^{95} + \dots - 2u + 1$
$c_3$	$u^{96} + u^{95} + \dots - 16u + 1$
$c_4$	$u^{96} - u^{95} + \dots + 16u + 1$
$c_5, c_{10}$	$u^{96} + u^{95} + \dots + 2u + 1$
$c_8$	$u^{96} - 7u^{95} + \dots - 71328u + 6545$
$c_9, c_{11}$	$u^{96} - 31u^{95} + \dots - 4u^2 + 1$
$c_{12}$	$u^{96} + 7u^{95} + \dots + 71328u + 6545$

### III. Riley Polynomials

Crossings	Riley Polynomials at each crossing
$c_1, c_7, c_9$ $c_{11}$	$y^{96} + 69y^{95} + \dots - 8y + 1$
$c_2, c_5, c_6$ $c_{10}$	$y^{96} - 31y^{95} + \dots - 4y^2 + 1$
$c_3, c_4$	$y^{96} - 3y^{95} + \dots + 32y + 1$
$c_8, c_{12}$	$y^{96} + 25y^{95} + \dots + 1210281936y + 42837025$