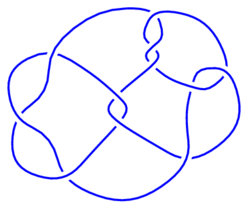
$11a_{156}$ ($K11a_{156}$)



[1]

Arc Sequences

$\rightarrow \overset{\uparrow}{6} \rightarrow \overset{\downarrow}{1} \rightarrow \overset{\uparrow}{10} \rightarrow \overset{\downarrow}{7} \rightarrow \overset{\uparrow}{2} \rightarrow \overset{\downarrow}{4} \rightarrow \overset{\downarrow}{5} \rightarrow \overset{\uparrow}{11} \rightarrow \overset{\uparrow}{3} \rightarrow \overset{\uparrow}{8} \rightarrow \overset{\uparrow}{9} \rightarrow$

Solving Sequence

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

Representation Ideals

$$I = \bigcap_{i=1}^{3} I_i^u$$

$$I_1^u = \langle a^2 + a - 1,\ b - 1,\ u - 1 \rangle$$
$$I_2^u = \langle u^5 + u^4 - 2u^3 - u^2 + u - 1,\ -u^4 - u^3 + u^2 + b + u,\ -u^4 - u^3 + 2u^2 + a + u - 1 \rangle$$
$$I_3^u = \langle u^{52} + 4u^{51} + \cdots + 4u + 1,\ 4.71525 \times 10^{15} u^{51} + 1.58394 \times 10^{16} u^{50} + \cdots + 2.41195 \times 10^{15} a + 4.70667 \times 10^{15}$$
$$6.61243 \times 10^{15} u^{51} + 1.85789 \times 10^{16} u^{50} + \cdots + 1.20598 \times 10^{15} b + 5.33978 \times 10^{15} \rangle$$

There are 3 irreducible components with 59 representations.

[1]The knot diagram image is adapter from "C. Livingston and A. H. Moore, KnotInfo: Table of Knot Invariants, http://www.indiana.edu/ knotinfo"

I. $I_1^u = \langle a^2 + a - 1,\ b - 1,\ u - 1\rangle$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} a \\ 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -a+1 \\ a+1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -a+1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -a+1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} a \\ a+1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -a+1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -a+1 \\ 0 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -1.61803$ $b = 1.00000$	7.23771	-1.00000
$u = 1.00000$ $a = 0.618034$ $b = 1.00000$	-0.657974	-1.00000

II.

$$\boldsymbol{I_2^u = \langle u^5+u^4-2u^3-u^2+u-1,\ -u^4-u^3+u^2+b+u,\ -u^4-u^3+2u^2+a+u-1\rangle}$$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.41878 - 0.21917I$ $a = -0.688402 + 0.106340I$ $b = 0.276511 + 0.728237I$	$-4.22763 - 4.40083I$	$0.88874 + 1.16747I$
$u = -1.41878 + 0.21917I$ $a = -0.688402 - 0.106340I$ $b = 0.276511 - 0.728237I$	$-4.22763 + 4.40083I$	$0.88874 - 1.16747I$
$u = 0.309916 - 0.549911I$ $a = 0.77780 + 1.38013I$ $b = -0.428550 + 1.039275I$	$1.31583 + 1.53058I$	$5.47076 - 5.40154I$
$u = 0.309916 + 0.549911I$ $a = 0.77780 - 1.38013I$ $b = -0.428550 - 1.039275I$	$1.31583 - 1.53058I$	$5.47076 + 5.40154I$
$u = 1.21774$ $a = 0.821196$ $b = 1.30408$	-0.756147	1.28099

III. I^u_3 =
$\langle u^{52}+4u^{51}+\cdots+4u+1,\ 4.72\times10^{15}u^{51}+1.58\times10^{16}u^{50}+\cdots+2.41\times10^{15}a+4.71\times10^{15},\ 6.61\times10^{15}u^{51}+1.86\times10^{16}u^{50}+\cdots+1.21\times10^{15}b+5.34\times10^{15}\rangle$

(i) Arc colorings

$$a_8 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-1.95495u^{51}-6.56705u^{50}+\cdots+28.7876u-1.95139\\-5.48305u^{51}-15.4057u^{50}+\cdots-12.9780u-4.42776\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-3.68020u^{51}-11.2318u^{50}+\cdots+15.3496u-1.69442\\-5.58018u^{51}-15.6928u^{50}+\cdots-14.1440u-4.54170\end{pmatrix}$$
$$a_1 = \begin{pmatrix}3.04950u^{51}+8.17051u^{50}+\cdots+21.6240u+0.0139407\\0.793379u^{51}+2.61016u^{50}+\cdots+5.11192u+1.01937\end{pmatrix}$$
$$a_5 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_7 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-u^2+1\\-u^2\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-u^3+2u\\-u^3+u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}4.48349u^{51}+11.2420u^{50}+\cdots+26.4736u+1.22167\\-6.66295u^{51}-17.7615u^{50}+\cdots-12.2545u-4.43585\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-1.95495u^{51}-6.56705u^{50}+\cdots+28.7876u-1.95139\\-6.99541u^{51}-19.7214u^{50}+\cdots-16.0340u-5.68051\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-0.672983u^{51}-1.64683u^{50}+\cdots-20.1906u+1.35247\\4.37386u^{51}+12.1235u^{50}+\cdots+8.43719u+3.36752\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-0.672983u^{51}-1.64683u^{50}+\cdots-20.1906u+1.35247\\4.37386u^{51}+12.1235u^{50}+\cdots+8.43719u+3.36752\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.50174 - 0.16615I$ $a = \ \ 0.847041 - 0.191078I$ $b = -0.013133 - 1.052438I$	$-3.43276 - 5.51955I$	$3.44676 + 5.36292I$
$u = -1.50174 + 0.16615I$ $a = \ \ 0.847041 + 0.191078I$ $b = -0.013133 + 1.052438I$	$-3.43276 + 5.51955I$	$3.44676 - 5.36292I$
$u = -1.402198 - 0.074034I$ $a = \ \ 0.026298 + 0.498656I$ $b = -0.352180 + 0.880291I$	$-7.29497 - 2.64942I$	$-4.44338 + 3.34527I$
$u = -1.402198 + 0.074034I$ $a = \ \ 0.026298 - 0.498656I$ $b = -0.352180 - 0.880291I$	$-7.29497 + 2.64942I$	$-4.44338 - 3.34527I$
$u = -1.38407 - 0.39928I$ $a = \ \ 0.950418 - 0.519474I$ $b = -1.05351 - 2.62657I$	$4.8388 - 14.0856I$	$4.47511 + 7.81322I$
$u = -1.38407 + 0.39928I$ $a = \ \ 0.950418 + 0.519474I$ $b = -1.05351 + 2.62657I$	$4.8388 + 14.0856I$	$4.47511 - 7.81322I$
$u = -1.378946 - 0.247438I$ $a = \ \ 0.271252 - 0.281524I$ $b = -0.887007 - 0.751694I$	$-5.16137 - 5.07594I$	$-4.54955 + 5.10386I$
$u = -1.378946 + 0.247438I$ $a = \ \ 0.271252 + 0.281524I$ $b = -0.887007 + 0.751694I$	$-5.16137 + 5.07594I$	$-4.54955 - 5.10386I$
$u = -1.351441 - 0.353349I$ $a = -0.140558 + 0.708704I$ $b = \ \ 0.84752 + 1.17755I$	$-1.50501 - 9.54274I$	$1.85083 + 7.58831I$
$u = -1.351441 + 0.353349I$ $a = -0.140558 - 0.708704I$ $b = \ \ 0.84752 - 1.17755I$	$-1.50501 + 9.54274I$	$1.85083 - 7.58831I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.328549-0.035384I$ $a=-0.887006+0.337115I$ $b=0.82303+1.25229I$	$-3.66540-1.40599I$	$-0.611498+0.934044I$
$u=-1.328549+0.035384I$ $a=-0.887006-0.337115I$ $b=0.82303-1.25229I$	$-3.66540+1.40599I$	$-0.611498-0.934044I$
$u=-1.317563-0.343001I$ $a=-1.030363+0.368587I$ $b=1.86581+2.14984I$	$1.19040-6.87281I$	$3.44653+5.24349I$
$u=-1.317563+0.343001I$ $a=-1.030363-0.368587I$ $b=1.86581-2.14984I$	$1.19040+6.87281I$	$3.44653-5.24349I$
$u=-1.292949-0.308455I$ $a=-0.712267-0.416416I$ $b=0.0060057+0.0289180I$	$-0.43994-3.90031I$	$3.26921+3.18847I$
$u=-1.292949+0.308455I$ $a=-0.712267+0.416416I$ $b=0.0060057-0.0289180I$	$-0.43994+3.90031I$	$3.26921-3.18847I$
$u=-1.137097-0.290463I$ $a=1.374134-0.228520I$ $b=-1.27324-0.72345I$	$7.94427-0.70276I$	$6.08078+4.95980I$
$u=-1.137097+0.290463I$ $a=1.374134+0.228520I$ $b=-1.27324+0.72345I$	$7.94427+0.70276I$	$6.08078-4.95980I$
$u=-0.580204$ $a=2.67461$ $b=-0.0292583$	7.82641	14.3532
$u=-0.132835-0.780812I$ $a=0.06154-1.98449I$ $b=0.44297-2.11091I$	$10.93851-3.24486I$	$10.33648+1.31467I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.132835+0.780812I$ $a = 0.06154+1.98449I$ $b = 0.44297+2.11091I$	$10.93851+3.24486I$	$10.33648-1.31467I$
$u = -0.0961714$ $a = -5.28170$ $b = -0.521490$	0.870137	11.8926
$u = 0.025225-0.733964I$ $a = 1.013165+0.836517I$ $b = 0.091858+0.873645I$	$3.67881+0.13440I$	$8.39486+0.12494I$
$u = 0.025225+0.733964I$ $a = 1.013165-0.836517I$ $b = 0.091858-0.873645I$	$3.67881-0.13440I$	$8.39486-0.12494I$
$u = 0.074798-0.790095I$ $a = 0.09641+1.81252I$ $b = -0.21960+2.60455I$	$5.55338+2.78570I$	$8.09999-3.02309I$
$u = 0.074798+0.790095I$ $a = 0.09641-1.81252I$ $b = -0.21960-2.60455I$	$5.55338-2.78570I$	$8.09999+3.02309I$
$u = 0.132597-0.815892I$ $a = -0.881245+0.738932I$ $b = -0.400704+0.617073I$	$3.16600+5.32735I$	$6.43395-6.25644I$
$u = 0.132597+0.815892I$ $a = -0.881245-0.738932I$ $b = -0.400704-0.617073I$	$3.16600-5.32735I$	$6.43395+6.25644I$
$u = 0.162075-0.912835I$ $a = 0.02239-1.67618I$ $b = -0.14542-2.31964I$	$9.71492+9.38312I$	$8.24847-6.11575I$
$u = 0.162075+0.912835I$ $a = 0.02239+1.67618I$ $b = -0.14542+2.31964I$	$9.71492-9.38312I$	$8.24847+6.11575I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.233395 - 0.621970I$ $a = 0.121692 - 0.469084I$ $b = 0.301370 - 0.643972I$	$-0.04711 + 1.88095I$	$-0.11775 - 4.20113I$
$u = 0.233395 + 0.621970I$ $a = 0.121692 + 0.469084I$ $b = 0.301370 + 0.643972I$	$-0.04711 - 1.88095I$	$-0.11775 + 4.20113I$
$u = 0.284366 - 0.204671I$ $a = 2.17051 + 2.08416I$ $b = -0.992506 + 0.871089I$	$1.28226 + 0.71509I$	$4.69271 + 2.87667I$
$u = 0.284366 + 0.204671I$ $a = 2.17051 - 2.08416I$ $b = -0.992506 - 0.871089I$	$1.28226 - 0.71509I$	$4.69271 - 2.87667I$
$u = 0.547772 - 0.373490I$ $a = -0.169088 + 0.556202I$ $b = 0.230311 - 0.116830I$	$-1.14630 + 1.33765I$	$-2.67722 - 5.83204I$
$u = 0.547772 + 0.373490I$ $a = -0.169088 - 0.556202I$ $b = 0.230311 + 0.116830I$	$-1.14630 - 1.33765I$	$-2.67722 + 5.83204I$
$u = 0.603398 - 0.723292I$ $a = -0.90356 - 1.16750I$ $b = 0.28241 - 1.46104I$	$3.59908 + 2.53417I$	$6.05449 - 3.57963I$
$u = 0.603398 + 0.723292I$ $a = -0.90356 + 1.16750I$ $b = 0.28241 + 1.46104I$	$3.59908 - 2.53417I$	$6.05449 + 3.57963I$
$u = 1.06893$ $a = 0.852931$ $b = 3.10864$	-0.325570	41.4776
$u = 1.106626 - 0.364040I$ $a = 0.605633 - 0.391307I$ $b = 0.450764 - 0.042660I$	$0.194027 - 1.037731I$	$3.66549 + 3.70521I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.106626 + 0.364040I$ $a = 0.605633 + 0.391307I$ $b = 0.450764 + 0.042660I$	$0.194027 + 1.037731I$	$3.66549 - 3.70521I$
$u = 1.120012 - 0.522556I$ $a = -1.186755 - 0.344801I$ $b = 1.09009 - 1.21453I$	$6.79512 - 4.31192I$	$5.58742 + 2.79599I$
$u = 1.120012 + 0.522556I$ $a = -1.186755 + 0.344801I$ $b = 1.09009 + 1.21453I$	$6.79512 + 4.31192I$	$5.58742 - 2.79599I$
$u = 1.197772 - 0.333839I$ $a = 1.060479 + 0.325663I$ $b = -1.72416 + 2.42689I$	$2.12355 + 1.28202I$	$4.52218 - 0.37137I$
$u = 1.197772 + 0.333839I$ $a = 1.060479 - 0.325663I$ $b = -1.72416 - 2.42689I$	$2.12355 - 1.28202I$	$4.52218 + 0.37137I$
$u = 1.222937 - 0.097232I$ $a = -0.059911 - 0.212416I$ $b = 1.005432 - 0.811990I$	$-2.53454 + 0.36656I$	$-2.03786 + 0.85265I$
$u = 1.222937 + 0.097232I$ $a = -0.059911 + 0.212416I$ $b = 1.005432 + 0.811990I$	$-2.53454 - 0.36656I$	$-2.03786 - 0.85265I$
$u = 1.260066 - 0.299259I$ $a = 0.214579 + 0.639852I$ $b = -0.65814 + 1.63743I$	$-0.14154 + 3.59160I$	$3.36417 - 4.10455I$
$u = 1.260066 + 0.299259I$ $a = 0.214579 - 0.639852I$ $b = -0.65814 - 1.63743I$	$-0.14154 - 3.59160I$	$3.36417 + 4.10455I$
$u = 1.351302 - 0.337431I$ $a = -1.002800 - 0.448533I$ $b = 0.54188 - 2.75177I$	$6.26071 + 7.29271I$	$5.67966 - 4.07345I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.351302 + 0.337431I$ $a = -1.002800 + 0.448533I$ $b = 0.54188 + 2.75177I$	$6.26071 - 7.29271I$	$5.67966 + 4.07345I$
$u = 1.41754$ $a = -0.969822$ $b = -1.07762$	1.56846	5.85293

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$u^2(u^5-u^4+\cdots+u-1)(u^{52}+2u^{51}+\cdots-28u-4)$
c_2	$u^2(u^5+3u^4+\cdots-u-1)(u^{52}+18u^{51}+\cdots-72u+16)$
c_3	$u^5(u^2+u-1)(u^{52}+2u^{51}+\cdots-64u-32)$
c_4	$(u-1)^2(u^5+u^4+\cdots+u-1)(u^{52}+4u^{51}+\cdots+4u+1)$
c_5	$u^2(u^5+u^4+\cdots+u+1)(u^{52}+2u^{51}+\cdots-28u-4)$
c_6, c_7	$(u+1)^2(u^5-u^4+\cdots+u+1)(u^{52}+4u^{51}+\cdots+4u+1)$
c_8	$(u+1)^5(u^2-u-1)(u^{52}+7u^{51}+\cdots+3u+1)$
c_9	$u^5(u^2-u-1)(u^{52}+2u^{51}+\cdots-64u-32)$
c_{10}, c_{11}	$(u-1)^5(u^2+u-1)(u^{52}+7u^{51}+\cdots+3u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$y^2(y^5+3y^4+\cdots-y-1)(y^{52}+18y^{51}+\cdots-72y+16)$
c_2	$y^2(y^5-y^4+\cdots+3y-1)(y^{52}+30y^{51}+\cdots-41760y+256)$
c_3, c_9	$y^5(y^2-3y+1)(y^{52}-36y^{51}+\cdots-10752y+1024)$
c_4, c_6, c_7	$(y-1)^2(y^5-5y^4+\cdots-y-1)(y^{52}-44y^{51}+\cdots-116y+1)$
c_8, c_{10}, c_{11}	$(y-1)^5(y^2-3y+1)(y^{52}-53y^{51}+\cdots+13y+1)$