The Burau Representation

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From **Title:** Burau representation and random walk on string links
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Pasted from <http://front.math.ucdavis.edu/9605.5163> :

The Burau matrices β_i, $1 \le i \le n-1$, are $n \times n$ matrices given as follows: Let $t \neq 0, 1$ be a complex number. If we think of β_i as a linear transformation on $\mathbb{C}^n$, then

$$\beta_i = \underbrace{(1) \oplus \cdots \oplus (1)}_{i-1 \text{ copies}} \oplus \begin{pmatrix} 1-t & t \\ 1 & 0 \end{pmatrix} \oplus \underbrace{(1) \oplus \cdots \oplus (1)}_{n-i-1 \text{ copies}},$$

$\rightarrow$ Infinitesimally, this is $0 \oplus 0 \oplus 0 \cdots \begin{pmatrix} -x & x \\ 0 & 0 \end{pmatrix} \oplus \cdots \oplus 0$

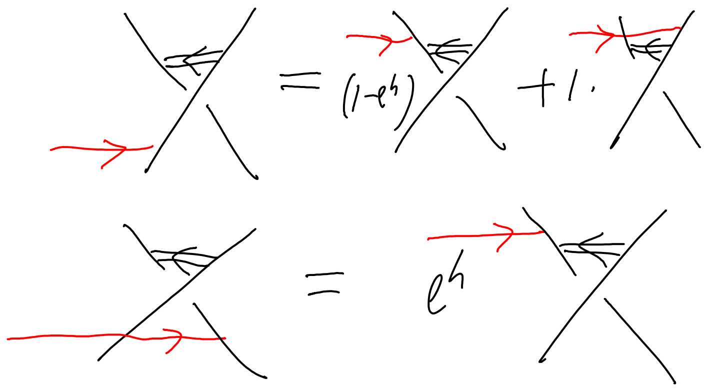
and

$$\beta_i^{-1} = \underbrace{(1) \oplus \cdots \oplus (1)}_{i-1 \text{ copies}} \oplus \begin{pmatrix} 0 & 1 \\ \bar{t} & 1-\bar{t} \end{pmatrix} \oplus \underbrace{(1) \oplus \cdots \oplus (1)}_{n-i-1 \text{ copies}}.$$

Here we use $\bar{t}$ to denote t^{-1} for simplicity.

Then take $\det'(I+B) = tr' \Lambda^* B$ to get the Alexander polynomial
(or maybe $\det'(I-B)$)

Consistent with head scattering:



hair is always coloured by the over strand.