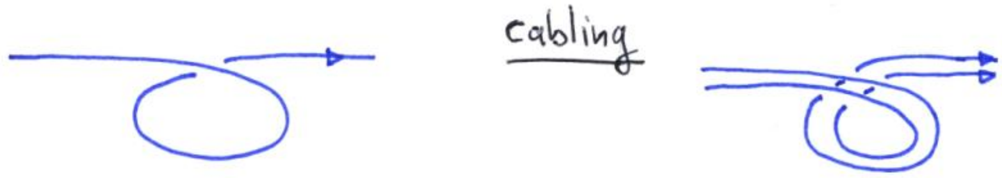
Thomas Fiedler's Marathon

June-16-08
9:17 AM

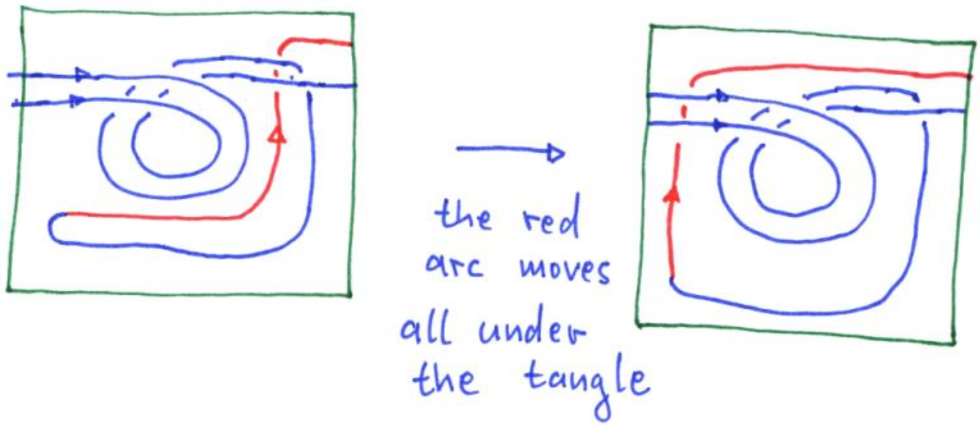
Study the Hartley / Kawauchi theorem about the Alexander polynomial of positive / negative Amphicheiral knots!

Is there a Kauffman's state model for the Alexander polynomial of virtual / w-knots?

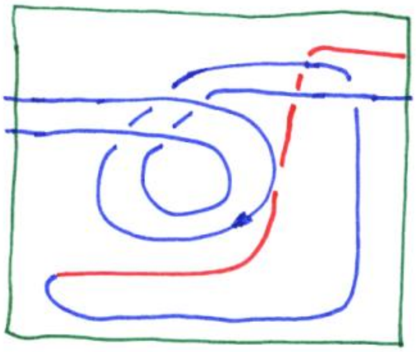
Long framed knot K ⟶ 2-cable of K

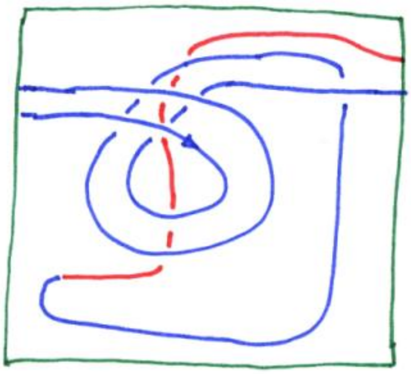


⟶ one parameter family of tangles in the green box
Scanning



⟶ to each triple crossing and to each auto-tangency we associate the end point of the highest strand and call it t[p]
decoration





$\longrightarrow$
evaluation

evaluation of the 1-cocycle Y on the one parameter family of diagrams gives an element in $H_2\, t[1] \oplus H_2\, t[2]$.

Here, H_2 is the Hecke algebra over $\mathbb{Z}[z, z^{-1}, v, v^{-1}]$.

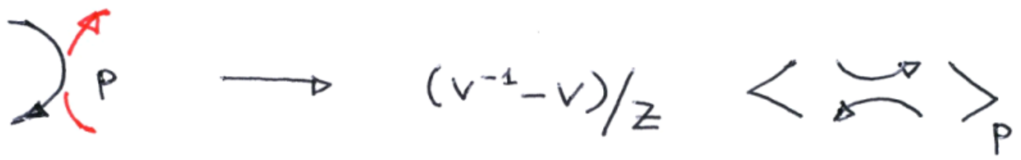
Y(2-cable of K) is an invariant of regular isotopy of K.

Definition of Y

Each triple crossing p in the family is replaced by

Here, $< \ >_p$ is the HOMFLYPT polynomial in H_2 of the tangle where the triple crossing is replaced by the tangle in the bracket.

In the same way



$Y \underset{\text{Def.}}{=} \sum_{\substack{\text{all triple} \\ \text{crossings } p}} \Big[\Big\langle$  $\Big\rangle_p - \Big\langle$  $\Big\rangle_p \Big] t[p]$

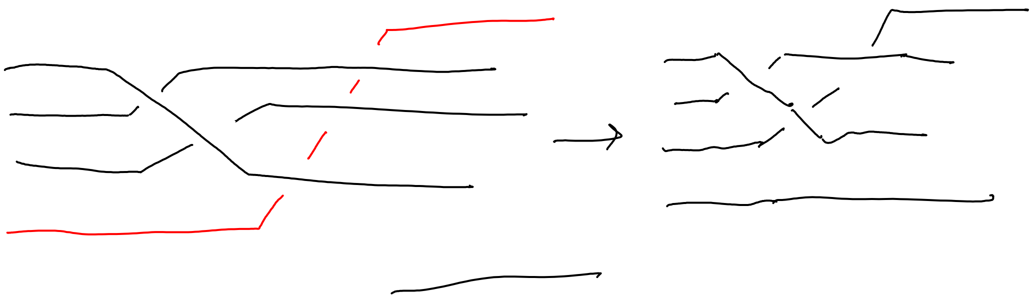
$- \left(\frac{v^{-1} - v}{z} \right) \sum_{\substack{\text{all auto-} \\ \text{tangencies } p}} \Big\langle$  $\Big\rangle_p t[p]$

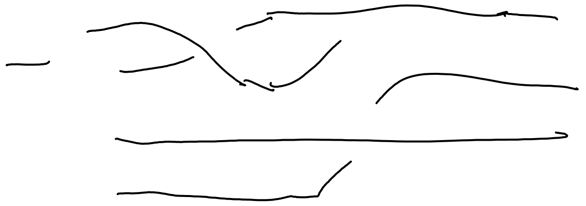
An example without cabling

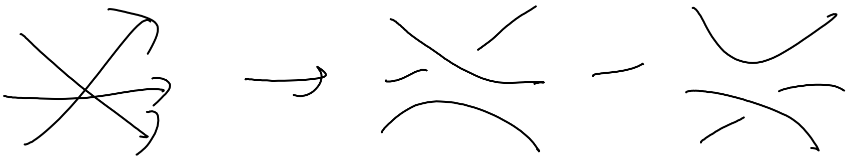
$Y($  $) = Y($  $) + Y($  $)$

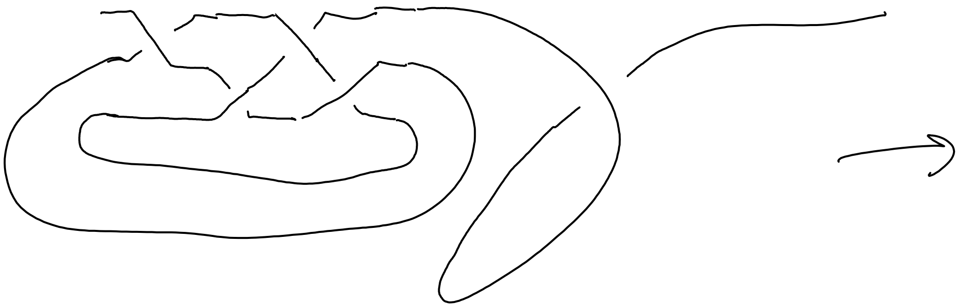
$= -\frac{v^{-1} - v}{z} \langle$  $\rangle + \langle$  $\rangle$

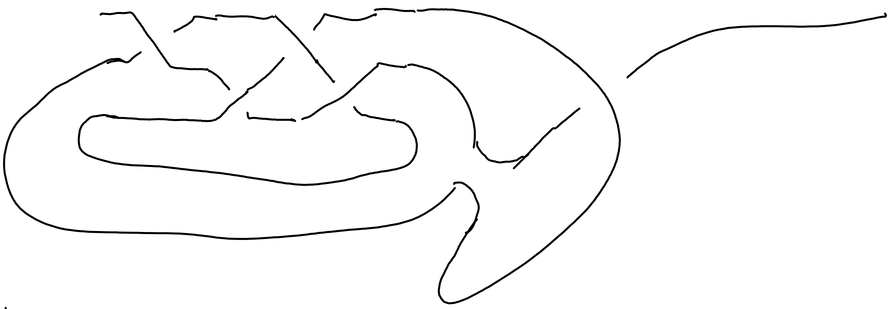
$- \langle$  $\rangle = -v^{-2}$











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