Conversation with Manturov

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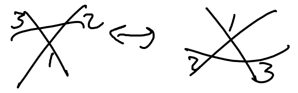
6:56 AM

A parity p on a "knot theory" (a theory of words in the sense of Turaev) is an assignment of a parity in $\mathbb{Z}/2$ for every knot diagram, so that

1. p is invariant relative to the "identity of xing" partial connection [so it is local and has a  property rel R3].

2. The sum of the parities of the xings involved in an R1, R2 or R3 move is even.

<u>Examples</u> 1. The number of chords (mod 2) intersecting a given chord, for v-knots.

2. For links, the parity of the number of components involved in a given xing.

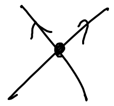
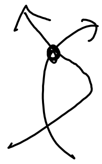
<u>Question</u> Is there a non-trivial parity for honest 1-component v-knots?

<u>Thm</u> "odd & irreducible" is minimal in a strong sense; follows from

<u>prop</u> $\sum_{\text{mod } 2} \left(\begin{matrix}\text{1-component Kauffman} \\ \text{smoothings of even xing}\end{matrix}\right) \Big/ \begin{matrix}\text{R2} \\ \text{moves}\end{matrix}$

is invariant also under R3.

<u>Another corollary</u> Non-trivial free knots exist

free knots = CA$\langle$  $\rangle$ / R1 R2 R3 & 

<u>Question</u> classify free knots.