Tangential derivations and virtual tangles

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There ought to be a map $\delta : \vec{A}_n^{prim} \longrightarrow tdr_n$.

<u>Questions</u> 1. Define it precisely.

2. Compute $\ker \delta$. (Or at least, find lots of relations in $\ker \delta$.

Realized in Homotopy for virtual,

<u>Construction of D</u>

$$\begin{tikzcd}
\vec{A}_n^{prim} \arrow[dr, "\alpha"'] & & Lie_n \arrow[dl, hook, "\beta"] \\
& \vec{A}_{n+1}^{\pi} &
\end{tikzcd}$$

For $D \in \vec{A}_n^{prim}$ & $x \in Lie_n$, $\delta_D x := \beta^{-1}[\alpha D, \beta x]$

The trick is to find the relations to impose on $\vec{A}_{n+1}^{\pi}$ so that this will make sense.

Aside - in the non-arrow case, the only relation required is homotopy on the last strand; and $\ker \delta$ seems to be "all loop diagrams".

Aside - Is there an Artin theory for "homology braids"? Or how about a group theoretic statement:

"A diagram
$$\begin{tikzcd}
F_n \arrow[dr] & & F_n \arrow[dl] \\
& G &
\end{tikzcd}$$
which descends to isomorphisms after Abelianization"?

Perhaps replace groups by quandles?

Speculative moral: Perhaps the whole relationship between knot theory and Lie algebras (and between knot theory and quantum groups) is bogus; it simply factors through the relationship of knot theory with group theory (or quandle theory) via the fundamental group of the complement. So perhaps I should forget about knot theory and study group theory.

First Guess $\to$ $\vec{A}^{TT}_{n+1}$ would be acyclic arrow diagrams each component of which touches strand $(n+1)$ at most once.