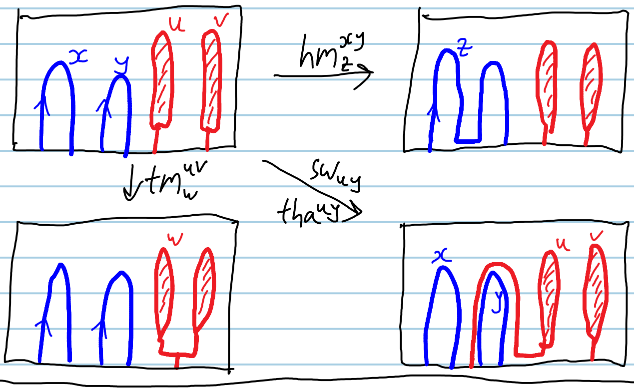
Aarhus Day 7 Handout

June-04-13
2:51 PM

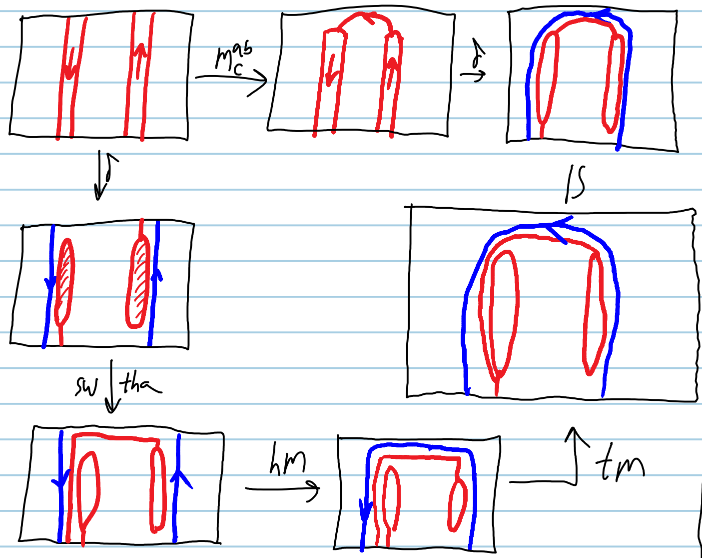
Q. In homotopy theory, there's $\pi_1(X) := [S^1, X]$ & $\pi_2(X) := [S^2, X]$. Why aren't people looking at $\pi_T(X) := [\text{cylinder}, (X, b)]$?

Ans. $\pi_T(X) = \pi_1(X) \ltimes \pi_2(X)$.

Recall.



So



Operations Consider $\mu = (\lambda = (x \to \lambda_x, y \to \lambda_y, \ldots); w)$

$\mu // tm_w^{uv} := \mu // (u, v \to w)$

$\mu // hm_z^{xy} := (\lambda \setminus \{x, y\} \cup (z \to bch(\lambda_x, \lambda_y)); w)$

$\mu // sw_{ux} = \mu // tha^{ux} = (\lambda, w + J_u(\lambda_x)) // RC_u^{\lambda_x}$

Today's Plan.

Morning: Finish the KBH/meta story

Afternoon session 1: a 10-minutes Dalvit video, then a 30 minutes braids summary

Afternoon session 2: Humbert on braids/tangles in genus 1: everything works, but with odd twists.

Evening (meaning 4:30): Movie night with Dalvit.

Thursday. 3 rushed sessions on Alekseev–Torossian–Enriquez–Kashiwara–Vergne, then Chu on f-knots.

Friday. All I know about v-knots — too little.

Claim. There is $Z^{bh}: K^{bh} \to A^{bh}$, and the diagram commutes

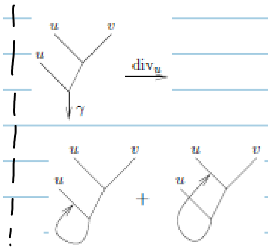
$$\begin{array}{ccc} wK(\uparrow_n) & \xrightarrow{wZ} & wA(\uparrow_n) \\ \downarrow \delta & \circlearrowleft & \downarrow A \\ K^{bh}(n;n) & \xrightarrow{Z^{bh}} & A^{bh}(n;n) \end{array}$$

$A^{bh}(T;H)$ is an algebra! Set $\zeta^{bh} = \log_{bh} Z^{bh}$. Enough to compute $\zeta^{bh}(\ \ )$ & hm, tm, sw on $P^{bh}(T;H) = FL(T)^H \times CW(T)$.

Clearly, $\zeta^{bh}(\ \ ) = (x \to u; 0)$.

Free Lie Preliminaries. Given $u \in T$ & $\gamma \in FL(T)$, automorphisms C_u^γ and $RC_u^{-\gamma}$, and spice $J_u(\gamma) \in CW(T)$:

$$\begin{array}{ccc} FL(T) & \overset{C_u^{-\gamma}}{\underset{RC_u^\gamma}{\rightleftarrows}} & FL(T) \\ \phi \searrow & & \swarrow \bar\phi \quad w \to \bar u \\ & FL(T \cup \{\bar u\}) \Big/ \left(\begin{array}{c} \bar u = e^{-\operatorname{ad}\gamma} u \\ \text{and / or} \\ u = e^{\operatorname{ad}\gamma} \bar u \end{array} \right) & \end{array}$$



$$J_u(\gamma) := \int_0^1 ds \, \operatorname{div}_u(\gamma \,//\, RC_u^{s\gamma}) \,//\, C_u^{-s\gamma}$$