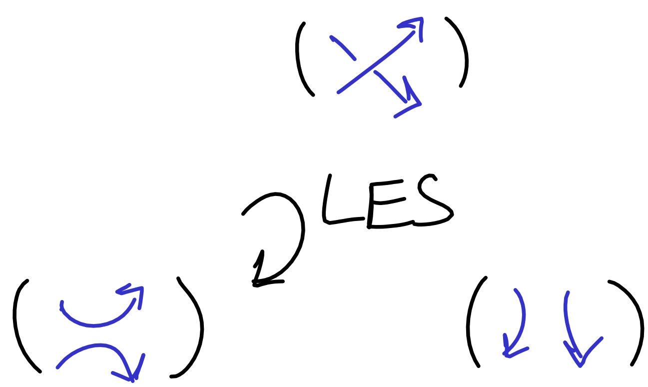
Liam Watson

Khovanov Homology via Immersed Curves in $S^2 - \{pt\}^4$

Kh categorifies the Jones polynomial

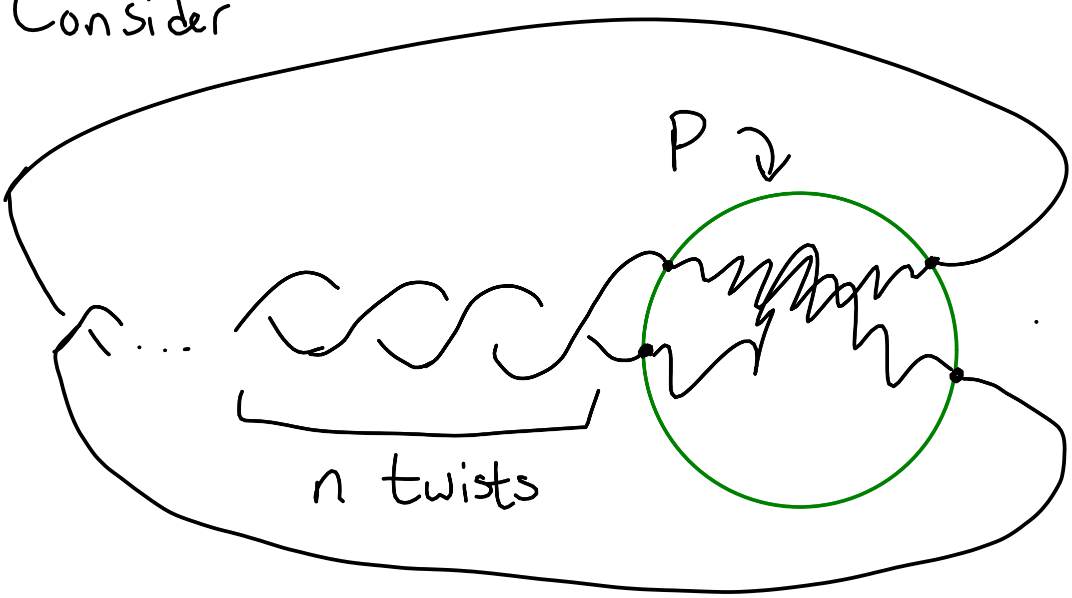
① $\widetilde{Kh}(\bigcirc) = \mathbb{F}$

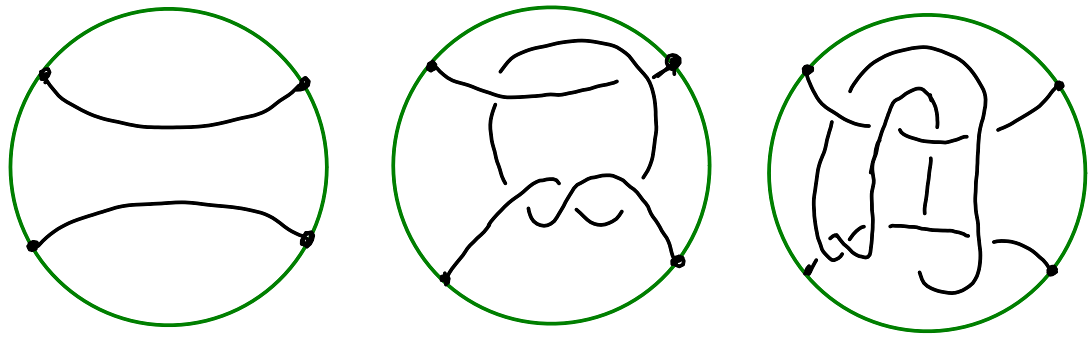
②

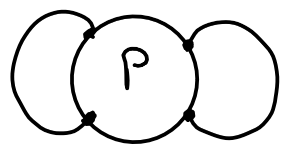


Obs $\widetilde{Kh}(T_{2,n}) \cong \mathbb{F} \oplus \widetilde{Kh}(T_{2,n+1})$
(note $n \leq 0$)

Consider



P = 

All satisfy  = unknot, have <u>sutures</u>

<u>Thm</u> $\overrightarrow{Kh}$() $= \mathbb{F}[x,y]/(x^3=y^2)$

Suppose $\underbrace{\Sigma}_{\text{(double branched cover)}}(\overbrace{T}^{\text{A tangle}}) = S^3 \setminus K$ for some knot

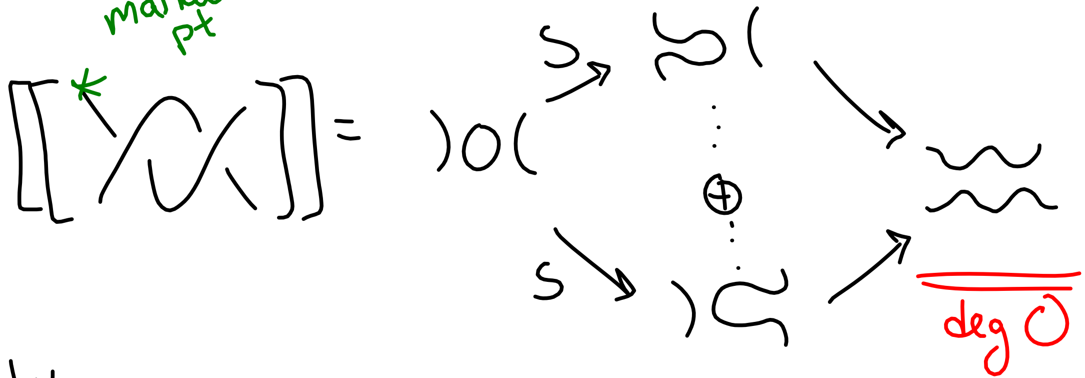
K an L-space knot iff(?) $\ker(x^N)$ is thin

Look at cabling operation

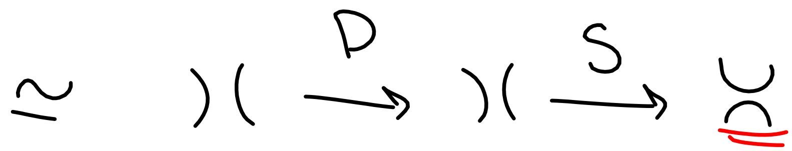
What does Khovanov cohomology come from geometrically? What bigraded info of a knot induces it?

Bar-Natan's Point of view

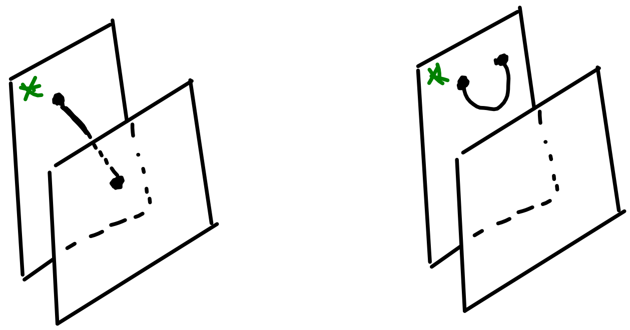
S = saddle

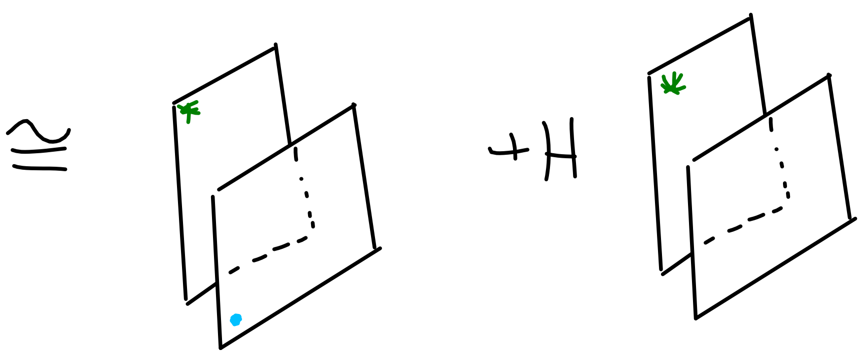


Ch. htpy

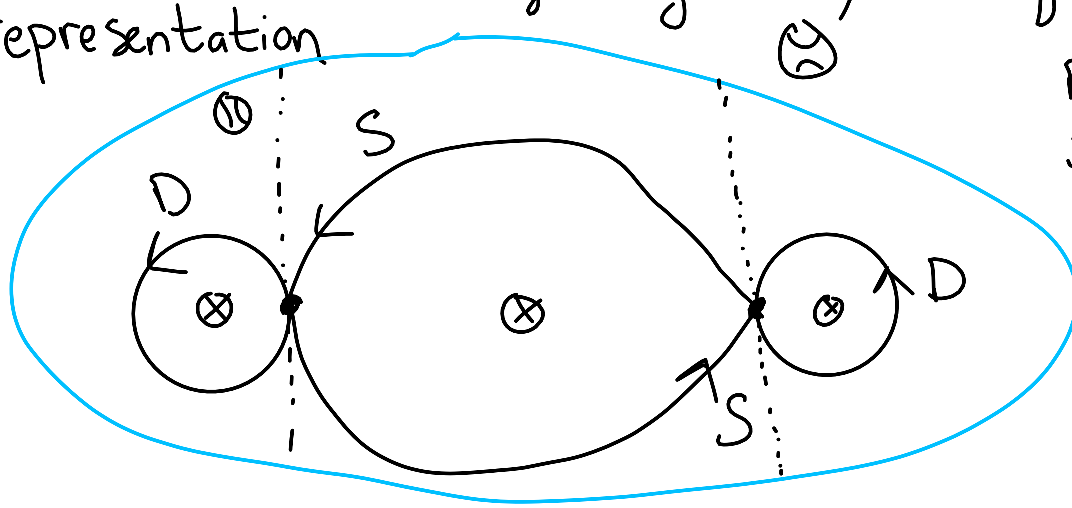


D:





Let $\mathcal{B}$ be the algebra given by the quiver representation



$DS = SD = 0$

$SS = D + H1$

Thm There is an invariant $\mathcal{BN}(T)$

And $\widetilde{\mathcal{BN}}$, $\widetilde{Kh}$, and $\underrightarrow{Kh}$ can be realized as $HF(\text{stuff}, \text{other stuff})$