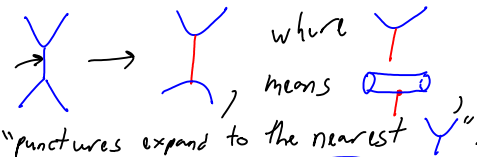
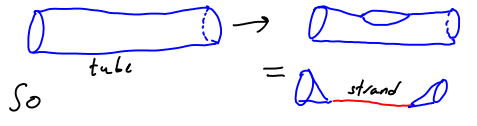


From 2010-06/Montpellier:  
Introduce "punctures".



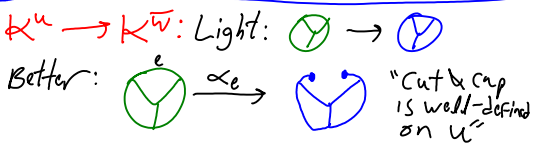
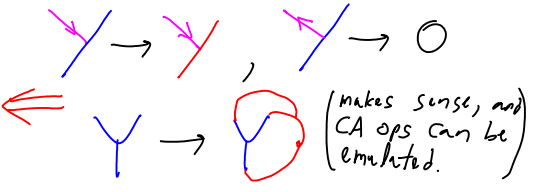
"punctures expand to the nearest Y":



$K^w$ : Allow tubes & strands & tube-strand vertices as above, but allow only compact knots - nothing runs to  $\infty$ .

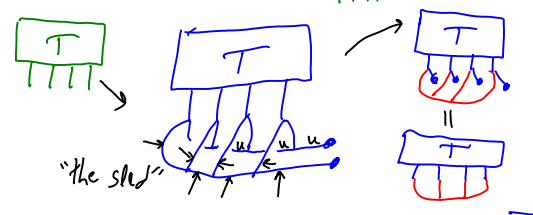
$K^w \leftrightarrow K^{\bar{w}}$ . Claim  $K^w$  has a homomorphic expansion iff  $K^{\bar{w}}$  has a homomorphic expansion.

$\Rightarrow$  Puncture  $A$  &  $Z$ :



**Theorem.** The generators of  $K^{\bar{w}}$  can be written in terms of the generators of  $K^u$  (i.e., given  $\mathcal{Q}$ , can write a formula for  $V$ ).

Sketch:  $\mathcal{A} \rightarrow \mathcal{A}$ ,  $\mathcal{B} \rightarrow \mathcal{B}$ , so enough to write any  $\mathcal{T}$ . Here go:



Goal: Do This right.