$\underline{SH^+}$

James

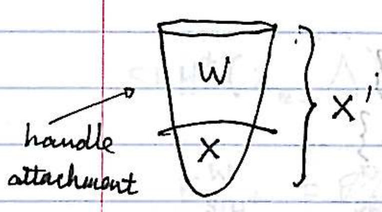
$$SH^+(X) = \check{CH}(X) \oplus \hat{CH}(X) \quad \text{(include bad orbits)}$$

$$d_{SH^+} = \begin{pmatrix} d_{\check{CH}} & d_M \\ \delta & d_{\hat{CH}} \end{pmatrix}$$

$$d_{\check{CH}},\ d_{\hat{CH}} = d_{CH}$$

$$d_M \hat{\gamma} = \begin{cases} 0 & \gamma \text{ good} \\ \pm 2\check{\gamma} & \gamma \text{ bad} \end{cases}$$

δ counts $\vee$ to $\wedge$ curves (see Nick's talk).



$$F^W_{SH^+} : SH^+(X') \longrightarrow SH^+(X)$$

$$F^W_{SH^+} = \begin{pmatrix} F^W_{\check{CH}} & 0 \\ \delta^W & F^W_{\hat{CH}} \end{pmatrix}$$

partner of SH^+ : LH^{Ho+} is the part corresponding to words of Reeb chords.

Each cyclic word of Reeb chords
$$w = c_1 \dots c_\ell$$
gives rise to ℓ ($\vee$ and ℓ $\wedge$) words, namely

$$\hat{c}_1 c_2 \dots c_\ell,\ c_1 \hat{c}_2 \dots c_\ell,\ \dots$$

$$\check{c}_1 c_2 \dots c_\ell,\ c_1 \check{c}_2 \dots c_\ell,\ \dots$$

These generators correspond to critical points of a Morse function on the orbit which will arise after surgery, having a max and a min on each chord.

$$\ker d_{Morse} = \{\Sigma \max,\ \text{each min}\}.$$
$$\operatorname{im} d_{Morse} = \{\Sigma c_i p_i : \Sigma c_i = 0\}.$$
$\uparrow_{\min}$

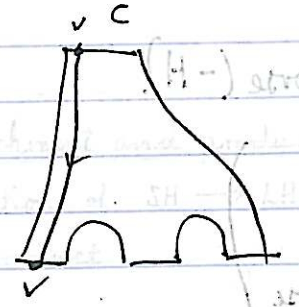
Define $S(c_1 \dots c_\ell) = \hat{c}_1 \dots c_\ell + c_1 \hat{c}_2 \dots c_\ell + \dots + c_1 c_2 \dots \hat{c}_\ell$

$$d_{LH^{Ho+}} = \begin{pmatrix} \check{d} & \alpha \\ 0 & \hat{d} \end{pmatrix}$$

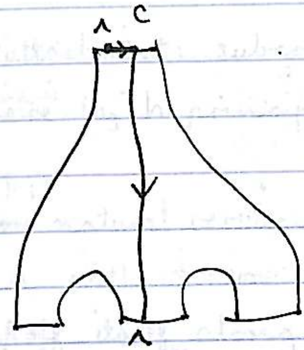
$\check{d}(\check{w}) = \sum \check{v}_j$ (i.e. dw with hat applied to each output).

$\hat{d}(\hat{c}\, w') = S(dc)\, w' + (-1)^{|c|+1}\, \hat{c}\, dw'$

Picture :



$\vee$ only goes to first letter in dc



$\wedge$ can go to any ~~__~~ letter in dc by flowing at the start.

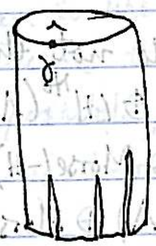
$$\alpha(\hat{c}_1\, c_2 \ldots c_\ell) = \check{c}_1\, c_2 \ldots c_\ell = c_1 c_2 \ldots \check{c}_\ell$$

$$SLH^+(X_0, \Lambda) = SH^+(X_0) \oplus LH^{Ho+}(\Lambda)$$

$$F^W_{SLH^+} = \cancel{F^W_{SLH^+}} \; F^W_{SH^+} \oplus F^W_{Ho+}$$

$$SH^+(X') \longrightarrow SLH^+(X, \Lambda)$$

F^W_{Ho+} counts



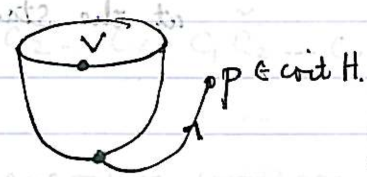
hat passes to any chord in output

for $\check{\gamma}$, check passes to one chord in output.

$$SH(X) = SH^+(X) \oplus \text{Morse}(-H).$$

$$d_{SH} = \begin{pmatrix} d_{SH^+} & 0 \\ \Theta & d_{Morse} \end{pmatrix}$$

where Θ counts

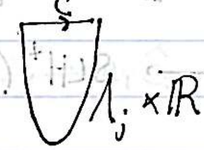


$$\rightsquigarrow LH^{Ho}(\Lambda) := LH^{Ho+}(\Lambda) \oplus C(\Lambda)$$

$$C(\Lambda) := \mathbb{F}\langle \tau_1, \dots, \tau_k \rangle$$

one for each handle Λ_j.

New differential counts



NB: This is equivalent to not throwing out the empty words of Reeb chords.

$$\begin{aligned} SLH(X, \Lambda) &= SH(X') \oplus LH^{Ho}(\Lambda) \\ &= SH^+(X) \oplus \text{Morse}(-H) \oplus LH^{Ho+}(\Lambda) \oplus C(\Lambda) \\ &= SLH^+(X, \Lambda) \oplus \text{Morse}(-H) \oplus C(\Lambda) \end{aligned}$$

$$F^{v}_{SLH} = \begin{pmatrix} F_{SLH^+} & 0 \\ \Psi & id \end{pmatrix}$$