

Deciphering Kawazumi / Kuno

Monday, October 12, 2015 9:24 AM

From Kawazumi:

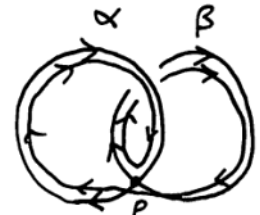
Goldman bracket

$\alpha, \beta \in \hat{\pi}$ (Choose their representatives) in general position.

$$[\alpha, \beta] \stackrel{\text{def}}{=} \sum_{p \in \alpha \cap \beta} \epsilon_p(\alpha, \beta) |\alpha_p \beta_p| \in \mathbb{Z} \hat{\pi}$$

where $\epsilon_p(\alpha, \beta) = \begin{cases} +1 & \text{if } \begin{array}{c} \nearrow \alpha \\ \nwarrow \beta \\ \text{P} \end{array} \\ -1 & \text{if } \begin{array}{c} \nwarrow \alpha \\ \nearrow \beta \\ \text{P} \end{array} \end{cases}$

local intersection number



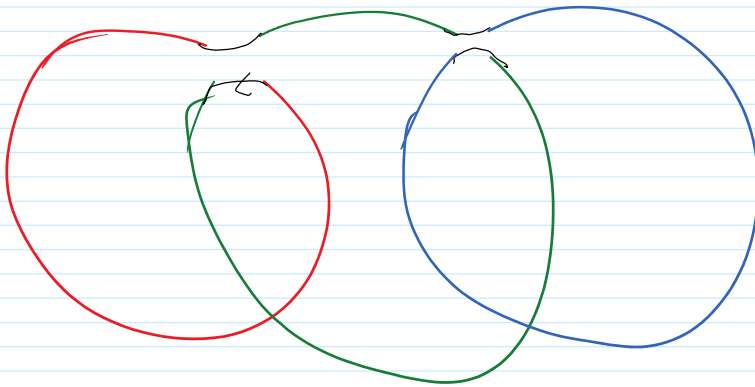
$\epsilon_p = -1$

α_p (resp. β_p) $\in \pi_1(S, p)$ based loop along α (resp. β)

Goldman

- (1) $[,]$: well-defined
- (2) $(\mathbb{Z} \hat{\pi}, [,])$: Lie algebra $(\rightsquigarrow \text{the Goldman Lie algebra of } S)$

Verify Jacobi:



$$[[GB]R]$$

$$[[RG]B]$$

