ⓘ Info

This note, that was found here, as a part of a collection
is written (completely with human hands) by Rupadarshi Ray,
was created on February 22, 2024 6:12:13 PM,
was last modified on May 17, 2026 7:36:37 PM, and
was exported on September 7, 2026 3:09:45 PM.

Linking number invariant of links

Definition. Linking number invariant of links

In S^3 with two knots K_1, K_2 (linked) we have

$$[K_2] \in \pi_1(S^3 \setminus K_1)_{\mathsf{Ab}} \cong \mathbb{Z}$$

hence $[K_2]$ maps to an integer. The linking number is that integer.

On the infinite cyclic cover $\tilde{X} \to S^2 \setminus K_1$ let $\tilde{K}_2$ denote the lift of the knot K_2 onto $\tilde{X}$ and let τ denote the generator of the deck group then

$$\tau^n(x_0) = K_2(1)$$

where n is the linking number of K_1 and K_2.

Let Σ_1 denote the Seifet surface of K_1 such that K_2 intersects transversally at every point in $K_2 \cap \Sigma_1$ we assign $+1, -1$ depending on whether it passes from N_+ or N_-. Then the sum of these numbers is the linking number.

$$\coprod Y_i$$

Current note has 0 direct children and 0 total descendants.

- stem
  - Knots
    - Knots in $\mathbb{R}^3$
      - Linking number invariant of links

And it has 5 siblings.

- stem
  - Knots
    - Knots in $\mathbb{R}^3$
      - Left trefoil knot
      - Complement of knots in $\mathbb{R}^3$ or S^3
      - Genus of a knot
      - Fundamental group of the complement of the knot
      - Linking number invariant of links