Knot Surgery and Integer Characterizing Slopes

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Knots in the 3-sphere

Definition

A *knot* K is the image of a smooth embedding of the circle S^1 into the 3-sphere S^3. In particular, K is diffeomorphic to S^1.

Definition

An *ambient isotopy* of S^3 between embeddings $g\colon S^1 \to S^3$ and $h\colon S^1 \to S^3$ is a continuous map $F\colon S^3 \times [0,1] \to S^3$, such that $F_t = F(\cdot, t)$ is a homeomorphism for each $t \in [0,1]$, $F_0 = \mathbb{1}$, and $F_1 \circ g = h$.

- We regard two knots $K, K' \subset S^3$ to be equivalent if they differ by an ambient isotopy of S^3. We write $K \simeq K'$.