Research program

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The following researches are projected.

• Can the (p, q)-cable version of the Γ-polynomial distinguish a mutant knot pair?

For $p = 1, 2, 3$, the (p, q)-cable version of the Γ-polynomial is invariant under mutation. Therefore, I study the (p, q)-cable version of the Γ-polynomial for mutant knots for $p \geq 4$. I have already shown that the $(4, 1)$- and $(5, 1)$-cable versions of the Γ-polynomial cannot distinguish a mutant pair of Kinoshita-Terasaka knot and Conway knot.

• Can the Γ-polynomials of knots be characterized by using knots with clasp number at most two?

It is known that the Γ-polynomials of knots are characterized by using 2-bridge knots with unknotting number one. I consider whether the Γ-polynomials of knots can be characterized by using knots with clasp number at most two.

• Knots which bound clasp disks of type 0 are prime?

There exist two homeomorphic classes of clasp disks with two clasp singularities, which are called types 0 and 1. It is known that $\mathrm{clasp}(K\#K') = 2$ for knots K and K' with $\mathrm{clasp}(K) = \mathrm{clasp}(K') = 1$. We see easily that $K\#K'$ bounds a clasp disk of type 1. I consider whether $K\#K'$ bounds a clasp disk of type 0.

• Local moves and the Γ-polynomials for knots

I have already shown that the Γ-polynomials of knots are invariant under clasp-pass moves in a certain condition. I study local moves and the Γ-polynomials for knots and apply it to calculations for the (p, q)-cable version of the Γ-polynomial.

• The Γ-polynomials of ribbon knots

I have already calculated the Γ-polynomials or its cable versions of Kinoshita-Terasaka knot, Kanenobu knot, Abe-Tange's ribbon knot. I want to obtain properties of ribbon knots from the Γ-polynomials.

• Every knot has a minimal grid diagram which presents a minimal closed braid diagram? (Joint work with Hwa Jeong Lee (KAIST))

Every knot has a minimal grid diagram. We consider whether the minimal grid diagram presents a minimal closed braid diagram.