TWIST OF KNOTS AND THE \( Q \)-POLYNOMIALS

CHAN-YOUNG PARK

(Joint work with Myeong-Ju Jeong and Younhee Choi)

For the \( Q \)-polynomial it is known that the \( n \)-th derivative \( Q_K^{(n)}(a) \) of the \( Q \)-polynomial \( Q_K(x) \) of a knot \( K \) at \( a \) is not a Vassiliev invariant if \( a \neq 1, -2 \).

The local transformation of two parallel strands with parallel orientation to the \( k \)-half twist of the two strands is called the \( t_k \)-move.

In this talk we show that, for any positive integer \( n \), \( Q_K^{(n)}(1) \) is not a Vassiliev invariant and \( Q_K^{(n)}(-2) \) is not a Vassiliev invariant of degree \( < 2n \), by using R. Trapp’s result on twist sequences of knots. Also by using higher derivatives \( Q_K^{(n)}(-2) \) of the \( Q \)-polynomial, we give some criterions to detect whether a knot \( K \) can be transformed to a knot \( K' \) by finitely many \( t_{2k} \)-moves, and if so, we give some results on the number of \( t_{2k} \)-moves necessary in the transformation.

This is a joint work with Dr. Myeong-Ju Jeong and Ms. Younhee Choi.

KYUNGPOOK NATIONAL UNIVERSITY