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Distinguishing mutant knots. (English) Zbl 07299385

J. Geom. Phys. 159, Article ID 103928, 31 p. (2021).

Summary: Knot theory is actively studied both by physicists and mathematicians as it provides a connecting centerpiece for many physical and mathematical theories. One of the challenging problems in knot theory is distinguishing mutant knots. Mutant knots are not distinguished by colored HOMFLY-PT polynomials for knots colored by either symmetric and or antisymmetric representations of $SU(N)$. Some of the mutant knots can be distinguished by the simplest non-symmetric representation [2, 1]. However there is a class of mutant knots which require more complex representations like [4, 2]. In this paper we calculate polynomials and differences for the mutant knot polynomials in representations [3, 1] and [4, 2] and study their properties.

MSC:

57K10 Knot theory

57K16 Finite-type and quantum invariants, topological quantum field theories (TQFT)

57K14 Knot polynomials

Keywords:

Chern-Simons theory; knot theory; mutant knots; HOMFLY-PT polynomials

Full Text: [DOI](#)

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