

KAUFFMAN BRACKET ON RATIONAL TANGLES AND RATIONAL KNOTS

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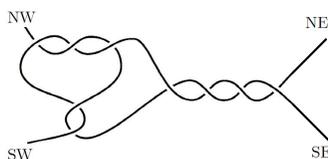
Abstract. Computing Kauffman bracket grows exponentially with the number of crossings in the knot diagram. In this paper we illustrate how Kauffman bracket for rational tangles and rational knots can be computed so that it involves a low number of terms. Kauffman bracket and Jones polynomial are known to have connections with statistical mechanics, quantum theory and quantum field theory.

MSC: 57M27

Keywords: Kauffman's bracket, knots and links, rational tangles

1. Introduction

A 2-tangle diagram is a region in a knot or link diagram surrounded by a rectangle such that the knot or link diagram crosses the rectangle in four points. These four points are usually thought of as fixed points occurring in the four corners NW, NE, SW, SE. See the following figure.



A *rational tangle* is a special 2-tangle that results from a finite sequence of twists of pairs of the four endpoints of two unknotted arcs. For the formal definition of a rational tangle see Definition 2. *Rational knots and links* are obtained by numerator closures of rational tangles; that is by connecting the two upper end points and the two lower endpoints of a given rational tangle by two unknotted and unlinked arcs. Rational knots and rational tangles are important in the study