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A STABILITY CONJECTURE FOR THE COLORED JONES POLYNOMIAL

STAVROS GAROUFALIDIS AND THAO VUONG

Abstract. We formulate a stability conjecture for the coefficients of the colored Jones polynomial of a knot when the color lies in a fixed ray of a simple Lie algebra. Our conjecture is motivated by a structure theorem for the degree and the coefficients of a q-holonomic sequences given in [6] and by a stability theorem of the colored Jones polynomial of an alternating knot given in [8]. We prove our conjecture for all torus knots and all simple Lie algebras of rank 2. Finally, we illustrate our results with a few explicit q-series.

1. Introduction

1.1. **The degree and coefficients of a q-holonomic sequence.** Our goal is to formulate a stability conjecture for the coefficients of q-holonomic sequences that appear naturally in Quantum Knot Theory [7]. Our conjecture is motivated by

(a) a structure theorem for the degree and coefficients of a q-holonomic sequence of polynomials given in [6],
(b) a stability theorem of the colored Jones polynomial of an alternating knot [8].

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