

COLOURED JONES POLYNOMIALS VIA THE TOPOLOGY OF CONFIGURATION SPACES

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The theory of quantum invariants for knots started with the Jones polynomial. After that, Reshetikhin and Turaev introduced an algebraic and combinatorial method which starting with a quantum group leads to a link invariant. The coloured Jones polynomials form a family of link invariants $\{J_N(L, q)\}_{N \in \mathbb{N}}$ constructed in this fashion from the quantum group $U_q(sl(2))$, having as first term the original Jones polynomial.

On the topological side, R. Lawrence defined a sequence of braid group representations using the homology of coverings of certain configuration spaces. Using this, Bigelow and Lawrence described a homological model for the original Jones polynomial, based on its skein nature for the proof.

We present a topological model for all coloured Jones polynomials. We show that $J_N(L, q)$ is a graded intersection pairing between two homology classes in a certain covering of the configuration space in the punctured disc.