

$U_q(sl(2))$ -QUANTUM INVARIANTS VIA TOPOLOGICAL INTERSECTION PAIRINGS

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The world of quantum invariants started with the the discovery of the Jones polynomial and continued with a purely algebraic method developed by Reshitikhin-Turaev that starting with a quantum group produces link invariants. The coloured Jones polynomials form a sequence of link invariants constructed in this manner from the quantum group $U_q(sl(2))$, containing the original Jones polynomial.

On the topological side, R. Lawrence introduced a sequence of braid group representations based on the homology of coverings of configurations spaces and using these, Bigelow and Lawrence gave a homological model for the original Jones polynomial.

We will present a topological model for all coloured Jones polynomials, showing that they can be described as graded intersection pairings between two homology classes in a covering of the configuration space in the punctured disc.

This shows that the sequence of Lawrence representations contains enough information to encode all coloured Jones polynomials and possibly more. If time permits, in the last part of the talk we will present some directions towards a topological description for normalized quantum type invariants and invariants at roots of unity using this procedure.