TOWARDS A GEOMETRICAL MODEL $U_q(sl(2))$-QUANTUM INVARIANTS

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In 1991, Reshetikhin and Turaev defined an algebraic method that starts with a quantum group and leads to link invariants. From $Rep(U_q(sl(2)))$ with q generic, one gets the Coloured Jones polynomials $J_N(L,q)$. However, if q is a $2N$-root of unity then $Rep(U_q(sl2))$ has a continuous family of modules and one obtains the ADO polynomials $\Phi_N(L,\lambda)$. We are interested in geometrical interpretations for these quantum invariants. For $N=2$ then $J_2(q)$ is the Classical Jones Polynomial. Bigelow and Lawrence interpreted it as a graded intersection pairing in a certain covering of a configuration space. In 2012, Kohno introduced relations between quantum and homological B_n-representations. He identified the heighest weight B_n-subrepresentations on the $U_q(sl(2))$-Verma module with the Lawrence representations. We will state a modified version of this theorem for the finite dimensional $U_q(sl(2))-$representations. Using this we will present a construction that leads towards a homological model for the coloured Jones polynomials.

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