

1077-57-2374

Benjamin Himpel* (himpel@imf.au.dk), Centre for Quantum Geometry of Moduli Spaces, Department of Mathematical Sciences, Aarhus U, Ny Munkegade 118, bldg. 1530, Aarhus, 8260, and **Jørgen Ellegaard Andersen**. *The asymptotic expansion of the Witten-Reshetikhin-Turaev invariants.*

Witten's influential invariants for links in 3-manifolds given in terms of a non-rigorous Feynman path integral have been rigorously defined first by Reshetikhin and Turaev. Their combinatorial definition based on the axioms of topological quantum field theory is expected to have an asymptotic expansion in view of the perturbation theory of Witten's path integral with leading order term (the semiclassical approximation) given by formally applying the method of stationary phase. Furthermore, the terms in this asymptotic expansion are expected to be well-known classical invariants like the Chern-Simons invariant, spectral flow, the Rho invariant and Reidemeister torsion. For mapping tori, the Witten Reshetikhin-Turaev invariants can also be defined as the characters of representations of central extensions of the mapping class group, constructed using the machinery of geometric Kähler quantization applied to the moduli space of flat connections on a surface. I will present new results on the expansion for finite order mapping tori, whose leading order terms we identified with classical topological invariants. (Received September 22, 2011)