Quantum Superalgebras at Roots of Unity & Topological Invariants of 3-manifolds

By Sacha Blumen

VDM Verlag Jul 2008, 2008. Taschenbuch. Book Condition: Neu. 220x150x16 mm. This item is printed on demand - Print on Demand Neuware - In this 2005 PhD thesis, topological invariants of closed, connected, orientable 3-manifolds are constructed from a family of quantum superalgebras at roots of unity arising from the osp(1 2n) family of Lie superalgebras. The representation theory of these quantum superalgebras at roots of unity is investigated and families of their finite dimensional representations, corresponding to the elements of truncated Weyl alcoves of the weight space, are defined. It is not known whether these representations are irreducible. Tensor product theorems for these representations are proved. Reshetikhin & Turaev s general method of constructing 3-manifold invariants from modular Hopf algebras, a class of Hopf algebras satisfying strict criteria, is extended to a wider class of algebras called pseudo-modular Hopf algebras. The quantum superalgebras arising from osp(1 2n) at certain even roots of unity are shown to be pseudo-modular Hopf algebras. The 3-manifold invariants arising from quantum osp(1 2n) are investigated and shown to be different to those arising from quantum so(2n+1). 264 pp. Englisch.

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