

Algebra/Topology Seminar

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QUANTUM GROUPS AND NICHOLS ALGEBRAS ACTING ON CONFORMAL FIELD THEORIES

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1:15 p.m. in ES-143

ABSTRACT. Associated with any even integral lattice there is a vertex algebra. This is an algebraic description of the correlation functions of a respective quantum field theory. I will give an explicit and unusual presentation of this algebraic structure.

My main result I want to talk about is that certain famous endomorphisms (screening operators) obey the relations of a Nichols algebras. Nichols algebras will here be viewed as a straightforward generalization of symmetric or exterior algebras, associated to a given braiding. The notorious example is the Borel part of a (small) quantum group. Having an action of quantum groups on vertex algebras associated to root lattices has been a long-standing conjecture by several researchers, which is solved by my result.

I will also sketch the proof. A main ingredient is a family of generalized Selberg integrals. I reduce the algebraic questions to the astonishing fact that these analytic functions should have zeroes whenever the Nichols algebra has a relation. Then I prove this fact by proving an analytic quantum symmetrizer formula.