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**Evgeny Mukhin\*** (mukhin@math.iupui.edu), Department of Mathematics, 402 N. Blackford St., LD 270, IUPUI, Indianapolis, IN 46202. *Representations of quantum toroidal  $gl(1)$ .*

Representation theory of the quantum toroidal algebra of  $gl(1)$  type is a surprising tool to study of the representations of more standard objects such as  $gl(\infty)$  or  $W_N$  algebras. The reason is that for this algebra, the singular vectors in the tensor products are often given by just one monomial (no linear combinations appear). On the other hand,  $gl(\infty)$  and  $W_N$  algebras are obtained by taking appropriate factorizations and limits.

We discuss a large class of the modules over the quantum toroidal  $gl(1)$  together with their degenerations which allows us to obtain simple combinatorial descriptions of various  $gl(\infty)$  and  $W_N$  modules.

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