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**Evgeny Mukhin\*** ([mukhin@math.iupui.edu](mailto:mukhin@math.iupui.edu)), Department of Mathematics, IUPUI, 402  
N.Blackford Street, LD270, Indianapolis, IN 46202. *Representations of the  $\mathcal{E}$ -algebra.*

We consider the  $\mathcal{E}$ -algebra which has many names in different publications: the elliptic Hall algebra, the quantum continuous  $gl(\infty)$ , the Ding-Iohara algebra, the quantum toroidal  $gl(1)$ ...

We will discuss a certain class of irreducible highest weight representation of the  $\mathcal{E}$ -algebra given by appropriate subquotients of the tensor products of the semi-infinite wedge constructions. Those representations come with natural bases labeled by the tuples of partitions with simple conditions. Different limits of these representations produce modules over  $W_n$  algebras or  $gl(\infty)$ . That gives a simple combinatorial description of those modules.

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