

Combinatorial Fock Space and Representations of Quantum Groups at Roots of Unity

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The classical Fock space arises in the context of mathematical physics, where one would like to describe the behaviour of certain configurations with an unknown number of identical, non-interacting particles. By work of Leclerc–Thibon, it has a realisation in terms of the affine Hecke algebra of type A and it controls the representation theory of the corresponding quantum group at a root of unity. In a joint work with Arun Ram and Paul Sobaje, we produce a generalisation of the q -Fock space to all Lie types. This gadget can also be realised in terms of affine Hecke algebras and captures the decomposition numbers of standard modules for representations of quantum groups at roots of unity.

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