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Quantum analogues of Richardson varieties in the grassmannian and their toric degeneration

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(Submitted on 7 Jul 2011)

In the present paper, we are interested in natural quantum analogues of Richardson varieties in the type A grassmannians. To be more precise, the objects that we investigate are quantum analogues of the homogeneous coordinate rings of Richardson varieties which appear naturally in the theory of quantum groups. Our point of view, here, is geometric: we are interested in the regularity properties of these "non-commutative varieties", such as their irreducibility, normality, Cohen-Macaulayness... in the spirit of non-commutative algebraic geometry. A major step in our approach is to show that these algebras have the structure of an Algebra with a Straightening Law. From this, it follows that they degenerate to some quantum analogues of toric varieties.

Submission history

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[v1] Thu, 7 Jul 2011 14:07:21 GMT (30kb)

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