Eighteenth International Conference on
Geometry, Integrability and Quantization
June 03–08, 2016, Varna, Bulgaria
Ivaïlo M. Mladenov, Guowu Meng
and Akira Yoshioka, Editors
Avangard Prima, Sofia 2017, pp 225–240
doi: 10.7546/giq-18-2017-225-240

DEFORMATION QUANTIZATION OF KÄHLER MANIFOLDS AND THEIR TWISTED FOCK REPRESENTATION

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Abstract. We introduce the notion of twisted Fock representations of noncommutative Kähler manifolds and give their explicit expressions. The so-called twisted Fock representation is a representation of the Heisenberg like algebra whose states are constructed by acting creation operators on a vacuum state. "Twisted" means that creation operators are not Hermitian conjugate of annihilation operators. In deformation quantization of Kähler manifolds with separation of variables formulated by Karabegov, local complex coordinates and partial derivatives of the Kähler potential with respect to coordinates satisfy the commutation relations between the creation and annihilation operators. Based on these relations, the twisted Fock representation of noncommutative Kähler manifolds is constructed.

MSC: 53D55, 81R60
Keywords: Deformation quantization, Fock representation, Kähler manifolds, noncommutative geometry

1. Introduction

Deformation quantization can be considered as a way to construct noncommutative manifolds. In this article, the deformation quantization with separation of variables is used to construct noncommutative Kähler manifolds, which was proposed by Karabegov [1–3]. The deformation quantization is an associative algebra on a set of formal power series of C^∞ functions with a star product between formal power series. In deformation quantization, the analytical techniques are available on noncommutative manifolds because star products are usually represented