talk

# FOCK REPRESENTATIONS AND DEFORMATION QUANTIZATION OF KÄHLER MANIFOLDS

**Akifumi Sako** [a] and **Hiroshi Umetsu** [b]

[a] Department of Mathematics, Faculty of Science Division II,
Tokyo University of Science, 1-3 Kagurazaka, Shinjuku-ku, Tokyo 162-8601, Japan
sako@rs.tus.ac.jp [presenter, corresponding]

[a] Fakultät für Physik, Universität Wien
Boltzmanngasse 5, A-1090 Wien, Austria

[b] National Institute of Technology, Kushiro College
Otanoshike-nishi 2-32-1 , Kushiro, Hokkaido 084-0916, Japan
umetsu@kushiro-ct.ac.jp

The goal of this talk is to construct the Fock representation of noncommutative Kähler manifolds. Noncommutative Kähler manifolds studied here are constructed by deformation quantization with separation of variables. This deformation quantization was given by Karabegov. The algebra of the noncommutative Kähler manifolds contains the Heisenberg-like algebras. Local complex coordinates and partial derivatives of a Kähler potential satisfy the commutation relations between creation and annihilation operators. A Fock space is spanned by a vacuum, which is annihilated by all annihilation operators, and states obtained by acting creation operators on this vacuum. The algebras on noncommutative Kähler manifolds are represented as those of linear operators acting on the Fock space. We call the representation of the algebra Fock algebra. In representations studied here, creation operators and annihilation operators are not Hermitian conjugate with each other, in general. Therefore, the bases of the Fock space are not the Hermitian conjugates of those of the dual vector space. In this case, we call the representation the twisted Fock representation. In this presentation, we construct the twisted Fock representations for arbitrary noncommutative Kähler manifolds given by deformation quantization with separation of variables, and we give a dictionary to translate between the twisted Fock representations and functions on noncommutative Kähler manifolds concretely.

## REFERENCES

[1] A. Sako, T. Suzuki and H. Umetsu, "Explicit Formulas for Noncommutative Deformations of $CP^N$ and $CH^N$," J. Math. Phys. **53**, 073502 (2012) [arXiv:1204.4030 [math-ph]].

[2] A. Sako and H. Umetsu, " Twisted Fock Representations of Noncommutative Kähler Manifolds, " [arXiv:1605.02600[math-ph]].

The first author is partially supported by JSPS KAKENHI Grant Number 16K05138.