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Zavoda za eksperimentalnu fiziku i Zavoda za teorijsku fiziku PMF-a)

Noncommutative Kähler manifolds and field theory

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Abstract:

Noncommutative Kähler manifolds are constructed by using a deformation quantization, and classical gauge theories on them are studied. At first, a pedagogical introduction to the deformation quantization is given. It includes the introduction to the Pursel-Shanks's theorem, the philosophy of the deformation quantization. Next, we study the deformation quantization with separation of variables, given by Karabegov. This is the way to obtain a noncommutative Kähler manifolds by using the deformation quantization. As examples, noncommutative $\mathbb{C}P^N$ and $\mathbb{C}H^N$ are observed. Then, we consider gauge theories on them. But there is a problem. To avoid the difficulty, the Fock representation is introduced for Noncommutative Kähler manifolds. Using this representation, gauge theories on noncommutative $\mathbb{C}P^N$ are discussed again.

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