A Generalization of the Quantization of Poisson Manifolds

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ABSTRACT

The noncommutative geometry is regarded as one of key concepts to formulate the quantum gravity theory or non-perturbative string theory. There are many ways to construct noncommutative geometry, for example deformation quantization, geometric quantization, C^*-algebra, matrix regularizations and so on. To find the best way for quantum gravity or other physics, more general formulation containing the existing quantization models is useful. We define a generalized quantization of Poisson manifolds as a subcategory of the category of modules over a ring. It is shown that the deformation quantization, geometric quantization, matrix regularizations are included in the generalization, and each pairs of them are essentially equivalence of categories. In addition, universal enveloping algebra derived from Poisson manifolds is also formulated as the generalized quantization of Poisson manifolds.