Seventeenth International Conference on
Geometry, Integrability and Quantization
June 5–10, 2015, Varna, Bulgaria
Ivaïlo M. Mladenov, Guowu Meng
and Akira Yoshioka, Editors
Avangard Prima, Sofia 2016, pp 392–401
doi: 10.7546/giq-17-2016-392-401

WEYL MANIFOLD: A QUANTIZED SYMPLECTIC MANIFOLD

AKIRA YOSHIOKA and TOMOYO KANAZAWA

Department of Mathematics, Tokyo University of Science, Kagurazaka1-3, Shinjuku-ku Tokyo 162-8601, JAPAN

Abstract. We give a brief review on Weyl manifold as a quantization of symplectic manifold, equipped with a system of quantized canonical charts and quantized canonical transformations among them called Weyl diffeomorphism. Weyl manifold is deeply related to deformation quantization on symplectic manifolds. We explain a relation between Weyl manifolds and deformation quantization.

MSC: 46L65, 53D55
Keywords: Deformation quantization, quantized symplectic manifold, star products, Weyl manifold

1. Introduction

In this note, we discuss Weyl manifold defined by Omori-Maeda-Yoshioka [5] (see also Yoshioka [7]). Weyl manifold is regarded as a quantized symplectic manifold and has a structure of fiber bundle over a symplectic manifold with fiber consisting of Weyl algebra, which is deeply related to deformation quantization on a symplectic manifold. The concept of deformation quantization was given by Bayen-Flato-Fronsdal-Lichnerowicz-Sternheimer [1], and the existence on symplectic manifold is established independently with different methods, first by Dewilde-Lecomte [2], then [5] and Fedosov [3]. The existence of deformation quantization on general Poisson manifolds are finally proved by Kontsevich [4].

A Weyl manifold has quantized canonical charts or quantized Darboux charts, glued by quantized canonical transformations, called Weyl diffeomorphisms. From a Weyl manifold over a symplectic manifold M we can construct a deformation quantization on M and also from a deformation quantization on M we obtain a