

STAR FUNCTIONS: EXAMPLES AND APPLICATIONS

AKIRA YOSHIOKA and TOMOYO KANAZAWA

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

Abstract. We give a review on non formal star product and its star exponentials with concrete examples.

MSC: 53D55, 46L65

Keywords: deformation quantization, star products

1. Introduction

In this note, we discuss a non-formal deformation quantization or non-formal star product. Star products are already treated by Weyl [13], Wigner [14] and Moyal [10]. These can be regarded as a deformation of functions of the usual multiplication of functions. For these, Bayen-Flato-Fronsdal-Lichnerowicz-Sternheimer proposed the concept of deformation quantization [1] in 1970's which introduces the new point of view for quantization.

Formal deformation quantization means that deformation is considered in the space of formal power series with deformation parameter, which is very successful. Any manifold is quantizable in the sense of formal deformation quantization (Kontsevich [7], see also Sternheimer [12]).

Meanwhile non-formal deformation quantization is to consider deformation with deformation parameter being a number. Then, a primitive question arises: Can we consider non formal deformation quantization on a manifold?

At present, we have no general theory for non-formal deformation quantization problem, and no idea at present either, but we have some examples.

In this note, we show some concrete examples on \mathbb{R}^n and \mathbb{C}^n which illustrate non-formal star product computation.