Twenty Second International Conference on
Geometry, Integrability and Quantization
June 8–13, 2020, Varna, Bulgaria
Ivaïlo M. Mladenov, Vladimir Pulov
and Akira Yoshioka, Editors
Avangard Prima, Sofia 2021, pp 301–307
doi: 10.7546/giq-22-2021-301-307

Geometry, Integrability and Quantization XXII

STAR MITTAG-LEFFLER FUNCTION

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Abstract. Star product for functions of one variable is given. A deformation of the Mittag-Leffler functions is suggested by means of the star product.

MSC: 53D55, 33C15, 33E12
Keywords: Deformation quantization, Kummer function, Mittag-Leffler function, star function, star product

1. Introduction

Deformation quantization was introduced some years ago by F. Bayen, M. Flato, C. Fronsdal, A. Lichnerowicz and D. Sternheimer [3] by which one can view quantum mechanics as a deformation of the structure of algebra of classical observables. The deformed algebraic structure, that is, the deformed product for classical observables is called star product. Deformation quantization was mainly studied in the frame of formal power series, that is, the deformed product is given as a formal power series of bi-differential operators. H. Omori, Y. Maeda, N. Miyazaki and A. Yoshioka [8] proposed a certain class of functions on $\mathbb{C}^n$ where the power series of star product converges. In [8] a family of star products parametrized by complex matrices was given whose star product is regarded as a slight generalization of the Moyal product. Namely, taking appropriate complex matrices, one can obtain the Moyal product and also the product of symbols of pseudo-differential operators. It was shown that there is an intertwiner between the star products of this family with common skew-symmetric part, with which the star product algebras are isomorphic. As an interesting application, it was shown that in terms of the simplest star product, that is, the star product for functions of one variable, one can describe the Jacobi theta functions as Fourier series of star exponentials. Also in [9], a deformation of the Kummer function is given by means of the star product,