

STAR KUMMER FUNCTION

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Abstract. Using a star product of one variable, we construct a deformation of the Kummer function, called a star Kummer function. We show the convergence of the power series of the star Kummer function and then we obtain that the star Kummer function is an entire function of the variable and also with respect to the deformation parameter.

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1. Introduction

Deformation quantization is introduced by Bayen *et al* [1, 2], in order to describe quantization as a deformation of usual classical mechanical systems. Deformation quantization is given by deforming a usual multiplication of functions by means of a power series of certain bi-differential operators to an associative product of functions, which is called a star product. This also can be regarded as an idea to obtain deformation of geometric objects. We have shown several concrete examples of deformation of functions [4].

In this note, we propose a one parameter deformation of Kummer function by means of non-formal star product. The deformed Kummer function is called a *star Kummer function*. We show convergence of the power series expansion of the Kummer function with respect to the variable and also with respect to the deformation parameter. Then the star Kummer function is an entire function on \mathbb{C} and is also analytic with respect to the deformation parameter.