

Twist deformations leading to κ -Poincare Hopf algebra and their application to physics

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We consider two twist operators that lead to κ -Poincare Hopf algebra, the first being an Abelian one and the second corresponding to a light-like κ -deformation of Poincare algebra. The advantage of the second one is that it is expressed solely in terms of Poincare generators. In contrast to this, the Abelian twist goes out of the boundaries of Poincare algebra and runs into envelope of the general linear algebra. Some of the physical applications of these two different twist operators are considered. In particular, we use the Abelian twist to construct the statistics flip operator compatible with the action of deformed symmetry group. Furthermore, we use the light-like twist operator to define a star product and subsequently to formulate a free scalar field theory compatible with κ -Poincare Hopf algebra and appropriate for considering the interacting ϕ^4 scalar field model on κ -deformed space.