Deformations of Spacetime Symmetries [Gravity, Group-Valued Momenta, and Non-Commutative Fields /

Arzano, Michele.,
author.
aut.
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Monografía

This monograph provides an introduction to deformations of PoincarÃ© symmetries focusing on models with a Lie group momentum space and associated non-commutative space-times. The emphasis is put on the emergence of such structures from quantum gravity, their mathematical features described in terms of Hopf algebras and applications to particle kinematics and field theory. Part I of this work focuses on the link between gravity and deformed symmetries in the case of 2+1 and 3+1 space-time dimensions. Part II is devoted to the description of classical particles with group valued momenta, their phase spaces and kinematics. The last part of these notes provides an introduction to the basic features of classical and quantum field theory on Îº-Minkowski space-time, the prototypical example of non-commutative space-time exhibiting deformed PoincarÃ© symmetry. The text, being the first providing a detailed overview of these topics, is primarily intended for researchers and graduate students interested in non-commutative field theories and quantum gravity phenomenology.

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