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Deformations and their controlling cohomologies of nonabelian embedding tensors on 3-Lie algebras

Abstract

In this paper, first we introduce the notion of a nonabelian embedding tensor on a 3-Lie algebra. In accordance with the general principles of deformation theories, a deformation theory of nonabelian embedding tensors is established. On the one hand, using the higher derived brackets, we construct an L∞-algebra whose Maurer-Cartan elements are nonabelian embedding tensors. Consequently, given a nonabelian embedding tensors T on a 3-Lie algebras, we obtain the twisted L∞-algebra that controls deformations of T. On the other hand, a 3-Lie algebra with a coherent action is identified from a nonabelian embedding tensors T such that the corresponding Loday-Pirashvili cohomology controls deformations of T. Finally, a linear deformations of nonabelian embedding tensors are studied. In particular, we introduce the notion of Nijenhuis elements on a 3-Lie algebras to characterize trivial linear deformations."