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Hom-pre-Poisson algebras and Hom-Gerstenhaber algebras up to homotopy.
Abstract
In this research, we study the concept of algebra up to homotopy for a structure defined by two operations. As important examples of this structure ; the Gerstenhaber algebra (commutatitve and Lie) and pre-Poisson algebra (Zinbiel and pre-Lie). A Hom-Gerstenhaber algebra is defined by a structure of commutative and Hom-associative algebra and a structure of a Hom-Lie algebra. We will give an explicit construction of the associated Hom-Gerstenhaber algebra up to homotopy, this is a bicoalgebra (Hom-coLie and Hom-coassociative) equipped with a codifferential which is a coderivation for the two coproducts allowing the construction of HomG∞-algebra. Furthermore, if we have a structure of Hom-pre-Lie algebra and Hom-Zinbiel algebras, we define the structure of Hom-pre-Poisson algebras verifying two compatibility conditions. We demonstrate that when A is a Hom-pre-Lie algebra, then a tensoriel algebra of A has a structure of Hom-pre-Poisson algebra. On the other hand, we prove that any Hom-Poisson algebra equipped with a Baxter operator can define a structure of Hom-pre-Poisson algebra.