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Rota-Baxter operators on BiHom-associative algebras and related structures. (English)
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Following the work of Makhlouf and Yau on Rota-Baxter Hom-algebras, Rota-Baxter on BiHom associative algebras are introduced. A BiHom associative algebra is an associative algebra with two commuting algebra endomorphisms $\alpha$ and $\beta$, with the following axiom:

$$\alpha(x)yz = xy\beta(z).$$

Firstly, BiHom dendriform, Zinbiel, tridendriform and quadri algebras are introduced, and classical relations between these objects are extended to the BiHom context. It is also proved that a Yau twist exists for all of them. Secondly, a theory of Rota-Baxter operators on these objects is developed. It is proved that if the Rota-Baxter operator $R$ commutes with both algebra endomorphisms, then the Yau twist is also a Rota-Baxter algebra. Free Rota-Baxter BiHom associative algebras are described with the help of planar trees and with considerations of functors related to Rota-Baxter structures. The paper ends with considerations on weak pseudotwistors.

Reviewer: Loïc Foissy (Calais)

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References:


N. Hu, q-Witt algebras, q-Lie algebras, q-holomorph structure and representations, Algebra Colloq. 6 (1999), 51-70.


