

On non-abelian extensions of Rota–Baxter algebras, dendriform algebras and Wells short exact sequence

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Abstract. A Rota–Baxter algebra A_R is an algebra A equipped with a distinguished Rota–Baxter operator R on it. Rota–Baxter algebras are closely related to dendriform algebras introduced by Loday. In this paper, we first consider the non-abelian extension theory of Rota–Baxter algebras of weight zero, and classify them by introducing the non-abelian cohomology. Next, given a non-abelian extension $0 \rightarrow B_S \rightarrow E_U \rightarrow A_R \rightarrow 0$ of Rota–Baxter algebras, we construct the Wells type exact sequences, and find their role in extending a Rota–Baxter automorphism $\beta \in \text{Aut}(B_S)$ and lifting a Rota–Baxter automorphism $\alpha \in \text{Aut}(A_R)$ to an automorphism in $\text{Aut}(E_U)$. We end this paper by considering a similar study for dendriform algebras.

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