

Algebras graded by discrete Doi-Hopf data and the Drinfeld double of a Hopf group-coalgebra

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We study Doi-Hopf data and Doi-Hopf modules for Hopf group-coalgebras. We introduce modules graded by a discrete Doi-Hopf datum; to a Doi-Hopf datum over a Hopf group coalgebra, we associate an algebra graded by the underlying discrete Doi-Hopf datum, using a smash product type construction. The category of Doi-Hopf modules is then isomorphic to the category of graded modules over this algebra. This is applied to the category of Yetter-Drinfeld modules over a Hopf group coalgebra, leading to the construction of the Drinfeld double. It is shown that this Drinfeld double is a quasitriangular graded Hopf algebra.

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