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"Uniqueness of braidings of quasitriangular Lie bialgebras and lifts of classical r-matrices"

International Mathematics Research Notices (2003), no. **46**, 2461–2486 DOI: 10.1155/S1073792803208138

ABSTRACT

It is known that any quantization of a quasitriangular Lie bialgebra \mathfrak{g} gives rise to a braiding on the dual Poisson-Lie formal group G^* . We show that this braiding always coincides with the Weinstein-Xu braiding. We show that this braiding is the "time one automorphism" of a Hamiltonian vector field, corresponding to a certain formal function on $G^* \times G^*$, the "lift of r", which can be expressed in terms of r by universal formulas. The lift of r coincides with the classical limit of the rescaled logarithm of any R-matrix quantizing it.

References

- [Dr] Drinfeld V. G., *Quantum groups*, Proc. Intern. Congress of Math. (Berkeley, 1986), 1987, pp. 798–820.
- [EE] Enriquez B., Etingof P., On the invertibility of quantization functors of Lie bialgebras, preprint math.QA/0306212.
- [EH] Enriquez B., Halbout G., An ħ-adic valuation property of universal R-matrices, J. of Algebra 261 (2003), 434-447.
- [EK] Etingof P., Kazhdan D., Quantization of Lie bialgebras. I, Selecta Math. (New Series) 2 (1996), 1–41; II–III, Selecta Math. (New Series) 4 (1998), 233–269.
- [Ga] Gavarini F., The quantum duality principle, Annales de l'Institut Fourier 152 (2002), 809–834.
- [GH] Gavarini F., Halbout G., Tressages des groupes de Poisson formels à dual quasitriangulaire, J. Pure Appl. Algebra 161 (2001), 295–307.
- [GH2] Gavarini F., Halbout G., Braiding structures on formal Poisson groups and classical solutions of the QYBE, J. of Geom. Phys. 46 (2003), 255–282.
- [Re] Reshetikhin N., Quasitriangularity of quantum groups at roots of 1, Commun. Math. Phys. 170 (1995), 79–99.
- [WX] Weinstein A., Xu P., Classical Solutions of the Quantum Yang-Baxter Equation, Commun. Math. Phys. 148 (1992), 309–343.