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“Dual affine quantum groups”

ABSTRACT

Let $\hat{g}$ be an untwisted affine Kac-Moody algebra, with its Sklyanin-Drinfel’d structure of Lie bialgebra, and let $\hat{h}$ be the dual Lie bialgebra. By dualizing the quantum double construction — via formal Hopf algebras — we construct a new quantum group $U_q(\hat{h})$, dual to $U_q(\hat{g})$. Studying its specializations at roots of 1 (in particular, its classical limits), we prove that it yields quantizations of $\hat{h}$ and $\hat{G}^\infty$ (the formal group attached to $\hat{g}$), and we construct new quantum Frobenius morphisms. The whole picture extends to the untwisted affine case the results known for quantum groups of finite type.

REFERENCES

[Lu1] G. Lusztig, Quantum groups at roots of 1, Geometriae Dedicata 35 (1990), 89–113.