Kawamura, Katsunori

*R*-matrices and the Yang-Baxter equation on GNS representations on \( C^\ast \)-bialgebras. (English) Zbl 1267.16033 Linear Algebra Appl. 438, No. 1, 573-583 (2013).

Let \( A \) be a \( C^\ast \)-bialgebra. If there is a dense \( \ast \)-subalgebra \( A_0 \) such that \( \Delta(A_0) \subset A_0 \otimes A_0 \), where \( \otimes \) denotes the algebraic tensor product of \( \ast \)-algebras, the author calls \( A \) an algebraic \( C^\ast \)-bialgebra. For example, every finite dimensional \( C^\ast \)-bialgebra is algebraic. For a state \( \psi \) of \( A \), let \( \mathcal{H}_\psi \) denote the corresponding GNS-representation space. Under some condition for a pair of states \( \psi \) and \( \omega \), the author constructs a unitary \( R \)-matrix

\[
R(\psi, \omega) : \mathcal{H}_\psi \otimes \mathcal{H}_\omega \to \mathcal{H}_\psi \otimes \mathcal{H}_\omega
\]

which satisfies an analogue of the quantum Yang-Baxter equation. By an example, he shows that such solutions exist for \( C^\ast \)-bialgebras \( A \) which are not quasi-cocommutative.

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MSC:

16T25 Yang-Baxter equations
46L05 General theory of \( C^\ast \)-algebras
16T10 Bialgebras
46L06 Tensor products of \( C^\ast \)-algebras
46L30 States of selfadjoint operator algebras

Keywords:

\( C^\ast \)-bialgebras; \( R \)-matrices; quantum Yang-Baxter equation; states; GNS representations

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