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Half twist type formulas for the R-matrix

The category of representation of $U_q(\mathfrak{g})$ can be used to construct invariants of oriented framed links, where $\mathfrak{g}$ is a complex simple Lie algebra, and $U_q(\mathfrak{g})$ is the corresponding quantized universal enveloping algebra. In the standard approach to the subject, a 360-degree twist has an interpretation in the category, but a 180-degree twist does not. Using a formula for the R-matrix due to Kirillov–Reshetikhin and Levendorskii–Soibelman, we explain how this 180 degree twist can be interpreted. We then modify of this construction to give a new formula for the R-matrix of any symmetrizable Kac–Moody algebra.

This includes joint work with Noah Snyder.