Referee report on the paper
"Algebraic Bethe Ansatz for spinor R-matrices"
by Vidas Regelskis

This paper is devoted to the investigation of $U_{q^2}(\mathfrak{so}_{2n+1})$- and $U_q(\mathfrak{so}_{2n+2})$-symmetric closed spin chains and computing of the eigenvectors and eigenvalues of the corresponding transfer matrices. Authors develops the algebraic Bethe ansatz for these models and uses a supermatrix realization of q-deformed spinor-spinor and spinor-vector R-matrices.

The paper generalizing nested Bethe ansatz technique for the spin chain models is rather technical and will require a lot of work from the reader to understand author's notations and approach. Nevertheless it presents new results on the quantum integrable models and I can recommend the paper "Algebraic Bethe Ansatz for spinor R-matrices" by Vidas Regelskis for publication in SciPost Physics Journal.

The only remark which I would like to mention is a possible contradiction between commutation relations of fundamental L-operators of the quantum loop algebra and their coproduct given in Definition 2.1 on pages 5 and 6. If one believes that these L-operators appear after specialization of the first tensor component of the corresponding universal $\mathcal{R}$-matrix onto composition of evaluation map and fundamental finite-dimensional representation $\pi(u)$

$$L(u) = (\pi(u) \otimes \mathrm{id})\ \mathcal{R}$$

then the commutation relations (2.17) in the paper follows from the YB equation for $\mathcal{R}$

$$(\pi(u) \otimes \pi(v) \otimes \mathrm{id})\ \mathcal{R}_{12} \cdot \mathcal{R}_{13} \cdot \mathcal{R}_{23} = (\pi(u) \otimes \pi(v) \otimes \mathrm{id})\mathcal{R}_{23} \cdot \mathcal{R}_{13} \cdot \mathcal{R}_{12}$$

$$R_{12}(u,v)\ L_1(u) \cdot L_2(v) = L_2(v) \cdot L_1(u)\ R_{12}(u,v)$$

and coproduct of this L-operators follows from the triangular property of $\mathcal{R}$

$$(\mathrm{id} \otimes \Delta)\ \mathcal{R} = \mathcal{R}_{13} \cdot \mathcal{R}_{12}$$

namely

$$\Delta\ L_{ij}(u) = \sum_k L_{kj}(u) \otimes L_{ik}(u).$$

Author has to be careful if coproduct formula (2.18) is used further in the practical calculations.