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Talk: Algebraic Bethe ansatz for the open XXZ spin chain with non-diagonal boundary terms via U_qsl_2 symmetry

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Although the open XXZ spin chain with non-diagonal boundary terms is known to be integrable, the corresponding Bethe ansatz equations cannot be derived directly because of the lack of a suitable reference state. They also present many unusual features, among which an "inhomogeneous" term which vanishes only if the parameters of the model satisfy a certain quantization condition known as the Nepomechie constraint. Reinterpreting the Hamiltonian of this spin chain as an abstract element of the two-boundary Temperley-Lieb algebra evaluated in its 2^N -dimensional vacuum representation, we construct a different $U_q sl_2$ -invariant realization of the same system. Using this stronger symmetry, we are then able to implement the standard boundary algebraic Bethe ansatz procedure for all values of the parameters satisfying the Nepomechie constraint. Additionally, our formalism provides a simple representation-theoretic interpretation of this condition in terms of $U_q sl_2$ fusion rules. If time permits, we will also comment on the scaling limit of this model. Based on joint work with A. Gainutdinov, J. Jacobsen and H. Saleur (2207.12772 + 2212.09696).

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