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Representation theory and q -difference equations in quantum integrable lattice models

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Abstract

I will give an overview of sets of q -difference equations arising in the context of quantum integrable lattice models, namely the six-vertex or XXZ model and its generalizations. These q -difference equations can be obtained via the decomposition of evaluation modules of the quantum affine algebra associated with $\mathfrak{sl}(2)$. The solutions to the difference equations are directly linked with solutions to the Bethe ansatz equations occurring in the quantum inverse scattering solution of these models. I will point out a number of open questions concerning the case when q is a root of unity. In the simplest case, $q^3 = 1$, the solution is explicitly known in terms of Schur functions. Time permitting I will also discuss the scaling limit to the XXX model.