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Baxter Q-operators for quantum affine superalgebras

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In this poster, we will discuss Baxter Q-operators for quantum affine superalgebras. As an example, we will mainly treat $U_q(\hat{sl}(2|1))$ case.

Transfer matrices of fusion models for $U_q(\hat{sl}(m|n))$ can be expressed as a certain determinant (quantum supersymmetric Jacobi-Trudi formula) [3]. We find that this formula can also be expressed as Wronkian-like form in terms of Baxter Q-operators. It may be view as another form of q-super character. To prove functional relations among Baxter Q-operators, we will consider tensor product of certain evaluation Verma modules of Borel subalgebra of $U_q(sl(\hat{2}|1))$ in terms of q-osciallator superalgebras. These modules are, in general, reducible but indecomposable modules. However on the level of the trace, they can be decomposed into certain shifted evaluation Verma modules.

There are remarkable correspondences between ordinarily differential equations and integrable systems (ODE/IM correspondence). We find that connection coefficients of a differential equation satisfy functional relations which are same as the ones for Baxter Q-operators.

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