

Vertex-IRF Correspondence and Factorized L -operators for an Elliptic R -operator

Youichi Shibukawa

Department of Mathematics, Hokkaido University, Sapporo 060, Japan.
Email: shibu@math.hokudai.ac.jp

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Abstract: As for an elliptic R -operator which satisfies the Yang–Baxter equation, the incoming and outgoing intertwining vectors are constructed, and the vertex-IRF correspondence for the elliptic R -operator is obtained. The Boltzmann weights of the corresponding IRF model satisfy the star-triangle relation. By means of these intertwining vectors, the factorized L -operators for the elliptic R -operator are also constructed. The vertex-IRF correspondence and the factorized L -operators for Belavin’s R -matrix are reproduced from those of the elliptic R -operator.

0. Introduction

In [12, 13, 14] we have introduced an infinite-dimensional R -matrix. It is a new solution of the Yang–Baxter equation. By means of the Fourier transformation of the R -matrix, we defined an R -operator acting on some function space. This R -operator also satisfies the Yang–Baxter equation. Since this operator is deeply linked to analytic properties of an elliptic theta function, we call it the elliptic R -operator. We have shown some properties satisfied by the elliptic R -operator, for example, first inversion relation, fusion procedure, etc. For the trigonometric degenerate case of the elliptic R -operator, we proved that the finite-dimensional, trigonometric R -matrices are constructed from the R -operator through restricting the domain of the R -operator to some finite-dimensional subspaces. Recently Felder and Pasquier [4] showed that Belavin’s R -matrix [3, 11] can be obtained through restricting the domain of a modified version of the elliptic R -operator to a suitable finite-dimensional subspace.

In [1], Baxter has introduced the intertwining vectors for the eight-vertex model. Jimbo, Miwa and Okado [8] constructed the outgoing intertwining vectors between Belavin’s vertex model and the $A_{n-1}^{(1)}$ face model. We call this relation the vertex-IRF correspondence for Belavin’s R -matrix. Hasegawa [6, 7], Quano and Fujii [10] defined the incoming intertwining vectors which are the dual vectors of the outgoing intertwining vectors. Then they constructed the factorized L -operators for Belavin’s R -matrix. The vertex-IRF correspondence plays a central role in their methods.