abstract

SPECIAL LECTURE
Topic:

Speaker:

Affiliation:

Date:

Time/Room:

The notion of Q-operator has been introduced by Baxter as a basic tool to solve quantum integrable systems. We develop Baxter Q-operator formalism for $\mathfrak{g}$-Toda chains for $\mathfrak{g}=\mathfrak{gl}(N,\mathbb{R})$. The constructed Q-operators provide a complete set of integral operators defining $GL(N,\mathbb{R})$-Whittaker functions; the eigenvalues of Q-operators are given by products of Gamma-functions, and the eigenvalues can be identified with Archimedean L-functions. The proposed construction unifies Givental and Mellin-Barnes integral representations for the $GL(N,\mathbb{R})$-Whittaker functions.

Our construction can be applied to the study of Siegel integrals. In particular this leads to a simple proof of Bump and Bump-Freidberg conjectures on Rankin-Selberg Archimedean L-functions.

We associate to the constructed Baxter operator a certain element of spherical Hecke algebra $\mathcal{H}(G,K)$ for $K=SO(N,\mathbb{R})$, and stress an analogy between the Q-operators and certain elements of the non-Archimedean Hecke algebra $\mathcal{H}(G(\mathbb{Q}_p),G(\mathbb{Z}_p))$.

Finally we discuss generalizations of our construction to other classical Lie algebras, and to affine Lie algebras $\widehat{\mathfrak{gl}}_N$.