RSEARCH PLAN

Background and Overview

In formulating Ichino–Ikeda conjecture on the special orthogonal group SO_n, Ichino–Ikeda used explicit formulas of unramified Shintani functions on SO_n over non-archimedean local field to compute a certain matrix coefficient.

I want to expand the theory of Shintani functions to the pair of the Jacobi group Sp_{2n}^J, which is a non-reductive group, and the symplectic group Sp_{2n}, and, as its application, study an analogue of Ichino–Ikeda conjecture for (Sp_{2n}^J, Sp_{2n}). Shintani functions also relate to a construction of automorphic L-functions and branching problem of automorphic representations. The study of Shintani functions is attractive in terms of number theory and representation theory. With such applications in mind, I'll work on the study of local Shintani functions on the Jacobi group Sp_{2n}^J.

Current Research Projects

(1) Deriving explicit formulas of Shintani functions for (Sp_{2n}^J, Sp_{2n}).

In general, local Shintani functions are defined by using an intertwining operator from the tensor product of irreducible representations of two *reductive* groups $G_0 \subset G$ to the trivial representation of G_0. First I'll expand the definition of local Shintani functions to non-reductive groups. Next I'll construct Shintani functions for (Sp_{2n}^J, Sp_{2n}) by using Poisson integrals, and will derive an explicit formula of the Shintani functions. I'll study Shintani functions associated with unramified principal series representations and discrete series representations at finite place and real place, respectively.

(2) Formulating a zeta integral of Murase–Sugano type for (Sp_{2n}^J, Sp_{2n}).

I'll formulate a global zeta integral of Murase–Sugano type and will attempt to prove basic identity. It is able to expect that the global integral relates to local integral having Shintani functions as integrands by the basic identity. I'll compute the local integral by using the explicit formulas of Shintnai functions and will consider a relation between the local integral and an automorphic local L-factor.

(3) Formulating Ichino–Ikeda conjecture for the Jacobi group.

I'll compute a matrix coefficient for (Sp_{2n}^J, Sp_{2n}) following Ichino–Ikeda, and will attempt to formulate Ichino–Ikeda conjecture for (Sp_{2n}^J, Sp_{2n}).