I. Title and Abstract

Rankin-Selberg integrals: relations between integrals arising from the doubling method and other families

David Soudry

Let G be an orthogonal group, or a unitary. I will show a relation between Rankin-Selberg integrals arising from the doubling method and integrals expressed in terms of so-called spherical Bessel models. As a result, I will obtain a relation between local gamma factors.

Gamma factors and related problems

Chufeng Nien

This talk is about related problems about gamma factors of a pair of representations of general linear groups over finite fields. We will discuss converse theorem, Gauss sums and distinction in terms of special values of gamma factors.

A new construction of representations of loop groups

Yongchang Zhu

Many parts of highly developed theory of reductive Lie groups have been generalized to loop groups, and new phenomenonena arise. However it is not known if there exists a generalization of principle series to loop groups; the obvious approach fails due to the lack of Haar measure on infinite dimensional Lie groups. In this talk we will discuss a new construction of representations of loop groups and the affine Kac-Moody Lie algebras.

Period Integrals, L-functions and (χ,b)-theory

Chenyan Wu

We introduce a new family of period integrals attached to irreducible cuspidal automorphic representations σ of symplectic groups. We show that it detects the poles of automorphic L-functions and hence the occurrences of (χ,b)-factors in the global Arthur parameter of σ.

Asymptotics of automorphic spectra

Werner Mueller

Abstract: In this talk I will discuss various problems concerning the limiting behavior of the cuspidal automorphic spectrum of a given reductive group over a number field. Especially this includes the Weyl law, the limit multiplicity problem and the study of families of automorphic forms. The basic tool to approach these problems is the Arthur trace formula.

On Bessel functions over complex number

Zhi Qi

In this talk, I will introduce Bessel functions over complex numbers in the context of analysis, number theory and representation theory. Such Bessel functions arise in the Voronoi formula and the Kuznetsov formula over the complex field. I will mainly talk about the complex analogue of the classical formulae of Hardy and Weber, which is motivated from the work of Baruch and Mao on generalizing the Waldspurger formula.

On Rankin-Selberg integrals expressed in terms of Bessel models for classical groups

David Soudry

I will consider a family of global integrals of Rankin-Selberg type for a pair of cuspidal representations on G, GL(n). They are expressed in terms of Fourier coefficients of "Bessel type", and, as a result, depend on a Bessel model of the representation on G. I will present the calculation of the corresponding local integrals with unramified data. It gives the corresponding local standard L-function.

The proof is by a sort of analytic continuation from the generic case that is when the representation on G has a Whittaker model.

The exterior cubic L-function of GU(6) and its poles

Lei Zhang

In this paper, we extend Ginzburg-Rallis' integral representation for the exterior cube automorphic L-function from GL(6) to GU(6) and extablish its analytic properties. Furthermore, we determine the irreducible cuspidal automorphic representations of GU(6) whose twist exterior cube L-functions have poles in terms of endoscopic classification.

Second variation of Selberg zeta function and positivity.

Genkai Zhang

Abstract: We find a second variation formula for the Selberg zeta function $Z(s)$ for Riemann surfaces on Teichmuller space. We prove its positivity at larger integral points $s=m$ and find its expansion for $m\to\infty$. (Joint work with K. Fedosova and J. Rowlett).

Symplectic Dirac cohomology and lifting of characters

Jing-Song Huang

A fundamental principle in representation theory and Langlands program is that of lifting or transfer of representations between reductive groups. We discuss the lifting of characters in Howe duality between special orthogonal group SO(2n+1) and the metaplectic covering group Mp(2n,R) in connection with the quantum correspondence and symplectic Dirac cohomology for the Lie superalgebra osp(1|2n). This is closely related to endoscopy, theta correspondence as well as transfer of orbital integrals, and is an important example of Langlands duality of root systems of type B_n and C_n.

Spectral theory on locally symmetric spaces and number theory

Mueller's colloquium talk on Wednesday afternoon

Spectral theory on locally symmetric spaces is closely related to the theory of automorphic forms and has deep connections to number theory. In this talk I will give an introduction to the subject, explaining some the major problems and goals with special emphasis on the question of the asymptotic distribution and location of the discrete spectrum.

On the local converse theorems for unitary groups

Qing Zhang

Let r be a positive integer, U_{2r+1} be the quasi-split unitary group of $2r+1$ variables and F be a p-adic field. We prove the following version of the local converse theorem for $U_{2r+1}(F)$: let π,π_0 be two irreducible generic supercuspidal representations of $U_{2r+1}(F)$ with the same central character, if $\gamma(s,\pi\times \tau,\psi)=\gamma(s,\pi_0\times \tau,\psi)$ for all generic irreducible representations τ of $GL_n(F)$ with $1\le n\le r$, then π is isomorphic to π_0. Similar considerations can give a proof of local converse theorems for $\Sp_{2r}, U_{r,r}$ and a possible new proof of Jacquet's

local converse conjecture for GL.

Coherent automorphic cohomology and automorphic representations
Jun Su

We'll show that the coherent cohomology of toroidal compactifications of locally symmetric varieties with coefficients in the canonical extensions of automorphic bundles can be expressed in terms of relative Lie algebra cohomology of automorphic representations. It follows that the Galois representations attached to these cohomology, if exist, are automorphic.

On the Kac-Moody Eisenstein series
Dongwen Liu

We survey some recent results about Eisenstein series defined on infinite-dimensional Kac-Moody groups, and some potential applications to the theory of automorphic forms. This talk is based on join works in part with L. Carbone, H. Garland, K.-H. Lee, S. Miller, and work in progress with Y. Zhu.

II. Schedule

Monday, July 3		
9:00-9:30	Registration	
9:30-10:30	David Soudry	Rankin-Selberg integrals: relations between integrals arising from the doubling method and other families
10:30-11:00	**Tea break**	
11:00-12:00	Chufeng Nien	Gamma factors and related problems
12:00-14:00	**Lunch**	
14:00-15:00	Yongchang Zhu	A new construction of representations of loop groups I
15:00-15:30	**Tea break**	
15:30-16:30	Chenyan Wu	Period Integrals, L-functions and (χ,b)-theory
16:30-17:30	Free discussion	

Tuesday, July 4		
9:30-10:30	Werner Mueller	Asymptotics of automorphic spectra I
10:30-11:00	**Tea break**	
11:00-12:00	Zhi Qi	On Bessel functions over complex number
12:00-14:00	**Lunch**	
14:00-15:00	David Soudry	On Rankin-Selberg integrals expressed in terms of Bessel models for classical groups
15:00-15:30	**Tea break**	
15:30-16:30	Lei Zhang	The Exterior Cubic L-function of GU(6) and its poles
16:30-17:30	Free discussion	

Wednesday, July 5

9:30-10:30	Jing-Song Huang	Symplectic Dirac cohomology and lifting of characters I
10:30-11:00		**Tea break**
11:00-12:00	Genkai Zhang	Second variation of Selberg zeta function and positivity I
12:00-15:00		**Lunch**
15:00-16:00	Werner Mueller	Spectral theory on locally symmetric spaces and number theory
16:00-17:00		**Tea break**

Thursday, July 6

9:30-10:30	Genkai Zhang	Second variation of Selberg zeta function and positivity II
10:30-11:00		**Tea break**
11:00-12:00	Jing-Song Huang	Symplectic Dirac cohomology and lifting of characters II
12:00-14:00		**Lunch**
14:00-15:00	Werner Mueller	Asymptotics of automorphic spectra II
15:00-15:30		**Tea break**
15:30-16:30	Qing Zhang	On the local converse theorems for unitary groups
16:45-17:45	Jun Su	Coherent automorphic cohomology and automorphic representations

Friday, July 7

9:30-10:30	Yongchang Zhu	A new construction of representations of loop groups II
10:30-11:00		**Tea break**
11:00-12:00	Dongwen Liu	On the Kac-Moody Eisenstein series
12:00		**Lunch**