

保型表現・保型形式とL関数の周辺

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RIMS

Abstract

Hiroki Aoki (Tokyo Univ. of Science)

Title: Vector valued Siegel modular forms with small levels

Abstract: On vector valued Siegel modular forms of degree 2 with respect to the symmetric tensor of degree 2, T.Satoh and T.Ibukiyama determined the structure with respect to the full modular group. There are ten generators with some relations. These generators are constructed from \mathbb{C} -valued Siegel modular forms by using Rankin-Cohen-Ibukiyama differential operators.

In this talk, I will talk about the structures of vector valued Siegel modular forms with small levels. Their structures are similar to the structure with respect to the full modular group. Namely, there are ten generators which are constructed from \mathbb{C} -valued Siegel modular forms by using Rankin-Cohen-Ibukiyama operators. To prove this result, we investigate the diagonal restriction of Siegel modular forms by using another kind of differential operators.

Jens Funke (Durham University)

Title: Special cohomology classes arising from the Weil representation

Abstract: Using the dual pair $\mathrm{Sp}(n) \times \mathrm{O}(p, q)$, we construct certain, special, cohomology classes for $\mathrm{O}(p, q)$ with values in the Weil representation. These classes are generalizations of previous work of Kudla and Millson. We discuss its geometric properties as Poincaré dual forms for certain, special, cycles with coefficients in a finite dimensional representation of the orthogonal group. Moreover, globally, theta series associated to these classes give rise to vector-valued holomorphic Siegel modular forms. Furthermore, we also determine the behavior of the classes at the boundary of the Borel-Serre compactification of arithmetic quotients of the associated symmetric space for $\mathrm{O}(p, q)$. As a consequence we obtain certain non-vanishing results for these cycles. This is joint work with J. Millson.

Valery Gritsenko (Lille Univ.)

Title: A solution of one automorphic problem of K. Saito

Abstract: A 1-dimensional t -extension of the classical symmetric domain of type IV was introduced in the theory of singularities by K. Saito and E. Looijenga in 1983. In 1991 K. Saito formulated a problem about construction of automorphic forms on this non-classical domain. This is a question about existence of automorphic forms $F(Z;t)$ on the orthogonal group $O(2,n)$ depending on additional parameter t . In 1997 H. Aoki constructed the first example of such forms using my lifting procedure for the Jacobi modular forms in n variables. It means that there exist a t -parameter extension of the lifted modular forms.

In this talk I would like to present a totally different approach to the Saito problem.

THEOREM. For any modular form $F(Z)$ of non-singular weight with respect to the orthogonal group $O(2,n)$ there exists its t -extension $F(Z;t)$, i.e, there exist a modular form $F(Z;t)$ on the extended domain such that $F(Z;0)=F(Z)$.

Yoshinori Hamahata (Tokyo University of Science)

Title: The Kodaira dimension of subvarieties of Siegel modular varieties

Abstract: We consider codimension 1 subvarieties of Siegel modular varieties. In principally polarized case, Freitag, Tsuyumine and Weissauer found subvarieties of general type. We present some subvarieties of general type in non-principally polarized case.

Shuichi Hayashida (Univ. of Siegen)

Title: Hilbert-Jacobi forms of a certain index of $Q(\sqrt{5})$ (joint work with N.-P.Skoruppa)

Abstract: Hilbert-Jacobi forms can be constructed by pair of Hilbert modular forms. The key of this construction is Wronski type Matrix of theta series. In the case $K = Q(\sqrt{5})$, by using this construction and by using the structure of space of Hilbert modular forms, we determined the structure of space of Hilbert-Jacobi forms of index $\epsilon/\sqrt{5}$ as module of Hilbert modular

forms, where O_K is principal order of $Q(\sqrt{5})$, and $\epsilon = (1 + \sqrt{5})/2$.

Miki Hirano (Seikei Univ.)

Title: Principal series Whittaker functions on $GL(3, \mathbf{C})$

Abstract: In this talk, we will give explicit formulas for Whittaker functions for principal series representations of $GL(3, \mathbf{C})$. This is joint work with Takayuki Oda.

近藤智 (数理研)

Title: ベイリンソン予想と楕円モジュラー曲線に関するベイリンソンの結果について (概説講演)

Abstract: ベイリンソン予想について解説する。ベイリンソンの結果である楕円モジュラー曲線のレギュレーターの計算について詳しく紹介する。

近藤智 (数理研)

Title: ベイリンソンの結果の関数体上の類似について (安田正大氏との共同研究)

Abstract: ベイリンソンの結果のドリinfeldt加群のモジュライにおける類似を定式化する。レギュレーターの計算の際にモジュライ空間上のある積分が現れること、およびその積分のオイラー系を用いた計算方法について述べる。

Tomoya Machide (Hokkaido Univ.)

Title: Elliptic Dedekind-Rademacher Sums and Transformation Formulae of Certain Infinite Series

Abstract: We give a transformation formula for certain infinite series in which some elliptic Dedekind-Rademacher sums arise. In the course of its proof, we also obtain a transformation formula for elliptic Dedekind-Rademacher sums. When a complex parameter τ tends to $i\infty$, these represent some classical results which include the reciprocity formula for Apostol-Dedekind sums.

Kimball Martin (Univ. of Oklahoma)

Title: Central L-values and periods for $GL(2)$

Abstract: We will give a brief survey the problem of expressing central values of (twisted) $GL(2)$ L-functions in terms of period integrals over compact tori (coming from the Jacquet-Langlands correspondence). Waldspurger first obtained a general formula relating these quantities, but there was also an interest in more refined formulas, such as those obtained by Gross, Zhang and others in special cases. These approaches rely on the theta correspondence, however there is also a trace formula approach to this problem initiated by Jacquet. We will end by discussing recent joint work with David Whitehouse, which follows Jacquet's approach and results in explicit formulas (à la Gross and Zhang) of the above type.

Alberto Minguez (Université Paris Sud)

Title: l -modular local theta correspondence

Abstract: In this talk we will discuss about the possibility of having a local theta correspondence for l -modular representations. For the dual pair of type $(GL(n), GL(m))$ we will show a new proof, valid if l is a prime number said *banal*. This proof allows us to describe the correspondence in terms of Langlands parameters.

Toshiyuki Kikuta (Kinki Univ.), and **Shoyu Nagaoka** (Kinki Univ.)

Title: Some p -adic properties of Siegel-Eisenstein series

Abstract: In our previous study, we attempted to generalize the notion of Serre's p -adic Eisenstein series and obtained several interesting formulas. For example, in the Siegel modular case, a correspondence between p -adic Siegel-Eisenstein series and theta series was reported. More precisely, certain p -adic Siegel-Eisenstein series were shown to coincide with the genus theta series of level p . This indicates a remarkable relationship between p -adic Siegel modular forms and Siegel modular forms on the congruence subgroup $\Gamma_0(p)$ of the so-called Nebentypus. In this talk, we show that a similar phenomenon occurs for Haupttypus.

成田宏秋 (大阪市立大学)

Title: Fourier expansion of Arakawa lifting (村瀬篤氏との共同研究)

Abstract: 荒川リフトと呼ばれる、楕円カスプ形式と定符号四元数環上の保型形式から四元数ユニタリー群 $GS\!p(1,1)$ へのテータリフトのフーリエ係数を、リフトされる保型形式の「トラス積分」と呼ばれる周期積分の観点から具体的に表示する公式を与える。その応用として、荒川リフトの非消滅の例を与える。

岡本亮彦 (早稲田大学)

Title: 重さ 1 のエータ積のテータ級数表示

Abstract: デデキントエータ関数を 2 つかけて作ったエータ積 (a, b) ($a+b=24k$, a, b, k : 自然数) は重さ 1 の適当なレベルと指標の modular form になる。この modular form を 2 元 2 次形式に付随するテータ級数を用いて表す。

Takeo Okazaki (Kyoto Univ.)

Title: Base change type spinor L-function of $GS\!p(2, \mathbf{Q})$

Abstract: In the theory of automorphic representation of $GS\!p(4)$, it is known that the CAP representations (cuspidal) have the same L-functions of non-cuspidal one. Besides, we happened to find a cuspidal representation whose spinor L-function is equal to that of non-cuspidal one. We will determine when such a phenomenon occurs by generalizing the ‘Zharkovskaya relation’. If we have time, for imaginary quadratic field K , we would like to talk about when π_K on $GL_2(K)$ is distinguished, related to the former topic.

佐藤文広 (立教大学理学部) + 小木曾岳義 (城西大学理学部)

Title: Representations of Clifford algebras and quartic polynomials with local functional equations

Abstract: 概均質ベクトル空間の理論の基本定理 (局所関数等式) は、大雑把に言うと、正則概均質ベクトル空間の相対不変式の複素ベキのフーリエ変換が双対概均質ベクトル空間の相対不変式の複素ベキにガンマ因子をかけたものと一致することを主張している。この講演では、概均質ベクトル空間の

相対不変式ではないにもかかわらず、その複素ベキが同種の局所関数等式を満たすような多項式が、クリフォード代数の表現より構成されることを報告する。

Masao Tsuzuki (Sophia Univ.)

Title: Spectral square means of period integrals for wave forms on real hyperbolic spaces

Abstract: By using the automorphic Green function and the automorphic heat kernel, we obtain an asymptotic behavior of the spectral square means of wave functions on real hyperbolic spaces.

若槻聡 (金沢大学)

Title: On traces of Hecke operators on spaces of Siegel cusp forms of degree two

Abstract: この講演では、2次のジ - ゲルカスプ形式の空間上のヘッケ作用素に対して、ある跡公式を与えます。我々の跡公式は具体的な数値が計算可能な公式を得るための一つのステップとなっています。実際、自明な作用の跡、つまり空間の次元に関しては計算可能な明示的な公式を得ることが出来ています。アイヒラ - 等によって得られた一変数の場合の明示的跡公式を復習したのち、我々の跡公式およびその証明について解説する予定です。

Shunsuke Yamana (Kyoto Univ.)

Title: An explicit construction of Jacobi forms and its applications

Abstract: From an elliptic cusp form, we construct a Jacobi cusp form, which gives a section of the descent map. This construction yields cusp forms in a Maass space on orthogonal groups. As an application, we show that the subspace of Siegel cusp forms generated by Ikeda lifts of elliptic cusp forms can be characterized by certain linear relations among Fourier coefficient.

Atsuo Yamauchi (Nagoya Univ.)

Title: Some vector-valued theta series on $U(2,2)$ and $Sp(1,1)$

Abstract: In this talk, we will explicitly construct some vector-valued

singular forms on $U(2,2)$, which are generalizations of theta series. The pull-backs of such singular forms to $Sp(1,1)$ are modular forms generating quaternionic discrete series, and have very simple Fourier coefficients. These modular forms (on $Sp(1,1)$) can be regarded as theta series on the hyperbolic space of dimension 4. (This is a joint work with Hiro-aki Narita.)

安田貴徳 (大阪市立大学)

Title: CAP automorphic representations of inner forms of $Sp(2)$

Abstract: $Sp(2)$ の inner form である四元数体上の双曲エルミート空間のユニタリ群の CAP 保型表現をテータ対応を用いて構成する。1次元歪エルミート空間のユニタリ群からのテータ対応を使う。これは $Sp(2)$ の留数スペクトルに現れる保型表現と同じ Arthur parameter を共有している。