Sendai spring conference on automorphic forms　Program and abstracts

Date: June. 21 – June. 23, 2024
Location: Science complex C (合同 C 棟) 2nd floor, Science Hall

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June 21, 13:00–14:00 Sugiyama, Shingo (Kanazawa University)

Title: Integrality of Hecke eigenvalues and the growth of Hecke fields
Abstract: It is well known that Hecke eigenvalues of elliptic modular forms are algebraic integers. Similar phenomena have been observed for Hilbert modular forms and for Siegel modular forms under certain constraints on weights and levels. In this talk, we prove that Hecke eigenvalues of Hilbert modular forms and of Siegel modular forms are algebraic integers in a general setting. As an application, we estimate the growth of the degrees of Hecke fields of cuspidal automorphic representations of $\mathrm{GL}(2d)$ with a prime number d and of $\mathrm{Sp}(2n)$. This is a joint work with Kenji Sakugawa (Shinshu University).

14:10–15:10 Wakatsuki, Satoshi (Kanazawa University)

Title: Non-vanishing theorems for prime twists of some modular L-functions
Abstract: In this talk, I discuss non-vanishing results on the central values of prime twists of modular L-functions by imaginary quadratic fields. After introducing a conjecture of Conrey, Keating, Rubinstein, and Snaith, I will explain our work on that conjecture using toric periods of algebraic modular forms. In particular, I would like to show specific numerical calculations by Magma. This talk is based on my several joint works with Masataka Chida, Hiroyuki Ochiai, Soma Purkait, Miyu Suzuki, Shun'ichi Yokoyama.

15:20–16:20 Tamotsu Ikeda (Kyoto University)

Title: On the Gross-Keating invariant and the Siegel series for a hermitian form over a non-archimedean local field.
Abstract: It is known that the Fourier coefficient of the Siegel-Eisenstein series has an Euler product expansion and the local factor is expressed by an infinite series called the Siegel series. The Siegel series is determined by the Gross-Keating invariant and its related invariants of a quadratic form. In this talk, we will give an analog of this theory for a hermitian form over a ramified quadratic extension of a non-archimedean local field. This is a joint work with H. Katsurada.

16:30–17:30 Ibukiyama, Tomoyoshi (Osaka University)

Title: Rankin-Cohen operators on Siegel modular forms and applications.
Abstract: So called Rankin-Cohen operator is a differential operator which gives a new modular form from several given modular forms. We have a general theory since 1990's but still there is new progress. We review the theory and explain several applications, such as application to moving slopes of moduli of principally polarized abelian varieties. The last part is a joint work with S. Grushevsky, G. Mondello. and R. Salvati Manni.

June 22, 9:15–10:15 Murakami, Yuya (Kyushu University)

Title: L-series invariants of 3-manifolds
Abstract: Quantum invariants are topological invariants of 3-manifolds motivated by physics. It is expected that quantum invariants can be written as radial limits of false theta functions, which are "false variants" of theta functions. Candidates of such functions are introduced by Gukov-Pei-Putrov-Vafa. In this talk, I introduce L-series invariants of 3-manifolds as Mellin transforms of Gukov-Pei-Putrov-Vafa invariants and prove that its special values coincide with quantum invariants.

10:30–11:30 Wang, Yiyang (Kyoto University)

Title: Formal Degrees and Parabolic Induction: the Maximal Generic Case
Abstract: The formal degree conjecture of Hiraga-Ichino-Ikeda expresses the formal degree (Plancherel measure) of a discrete series of a reductive p-adic group in terms of its adjoint gamma factor and Langlands parameter. For a non-supercuspidal discrete series representation, it ' s thus natural to study the relation of its formal degree to the formal degree of its cuspidal support. I ' ll explain the ideas on how to use tools from local harmonic analysis to deal with the case of a maximal parabolic subgroup, together with an application and future problems.

Afternoon is for free discussion.

June 23, 9:20–10:20 Takeda, Nobuki (Kyoto University)

Title: Congruences and differential operators on automorphic forms
Abstract: It is well known that there is often a congruence between Hecke eigenvalues of different types of Hecke eigenforms. Recently, the congruence in the vector-valued case has also been studied. In this talk, we will explain the methods of the study, focusing on the Mizumoto-Kurokawa congruence that we have proved. We will also introduce a reinterpretation of differential operators on automorphic forms used in the proof by the representation theory.

10:30–11:30 Watanabe Masahiro (Kyoto University)

Title: On the Recursion Formula of the Ramified Siegel Series
Abstract: The ramified Siegel series can be obtained from the Fourier coefficients of the Siegel-Eisenstein series. Several research has been carried out on the Siegel-Eisenstein series. In this talk, we will discuss the calculation of the recursion formula for the ramified Siegel series. We have shown this recursion formula by constructing a bijective proof from the combinatorial formula used by Sato and Hironaka to show the local density. We will discuss the functional equations of the ramified Siegel series if time permits.

11:40–12:40 Lan, Kai-Wen (U. Minesota and Kyoto University)

Title: Some vanishing results for the rational completed cohomology of Shimura varieties
Abstract: I will start with some introduction to Shimura varieties and their completed cohomology, and report on my joint work in progress with Lue Pan which shows that, in the rational p-adic completed cohomology of a general Shimura variety, "sufficiently regular" infinitesimal weights (whose meaning will be explained) can only show up in the middle degree. I will give some examples and explain the main ingredients in our work, if time permits.