

ISSN 1881-6193

RIMS Kôkyûroku Bessatsu B53

Algebraic Number Theory and Related Topics 2013

edited by Tadashi Ochiai, Takeshi Tsuji and Iwao Kimura

September, 2015

Research Institute for Mathematical Sciences
Kyoto University

RIMS Kôkyûroku Bessatsu B53

*Algebraic Number Theory
and*

Related Topics 2013

December 9 ~13, 2013

edited by Tadashi Ochiai, Takeshi Tsuji and Iwao Kimura

September, 2015

Research Institute for Mathematical Sciences

Kyoto University, Kyoto, Japan

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Preface

The RIMS workshop “Algebraic Number Theory and Related Topics 2013” was held at Research Institute for Mathematical Sciences, Kyoto University from December 9 to December 13, 2013. The workshop was organized by Tadashi Ochiai (Osaka University), Takeshi Tsuji (University of Tokyo) and Iwao Kimura (University of Toyama).

The aim of the workshop was to overview recent developments in diverse branches related to algebraic number theory. There were research talks on Iwasawa theory, l -adic Galois representations, modular forms, p -adic Hodge theory, algebraic cycles and so on. We also invited several speakers to give survey talks on recent developments in number theory. The conference program included 28 talks and we had 169 participants during the conference.

This volume of RIMS Kôkyûroku Bessatsu edited by the three organizers is a collection of articles contributed by speakers of the conference. They are classified into three categories following the views of the authors and the anonymous referees: research articles, research announcements and survey articles. Each paper has been refereed and is in its final form.

We would like to express our gratitude to participants, speakers and everyone who contributed to the success of the conference. We would also like to express our sincere gratitude to the authors and the anonymous referees of the articles of this volume for their excellent jobs on a tight schedule.

September 2015

Tadashi Ochiai
Takeshi Tsuji
Iwao Kimura

Program

Algebraic Number Theory and Related Topics 2013

Date December 9 (Mon) - December 13 (Fri), 2013

Place Room 420, Research Institute for Mathematical Sciences, Kyoto University

December 9 (Mon)

- 9:55 – 10:05 Introduction
- 10:05 – 11:05 Koichi Kawada (Iwate University)
The ternary Goldbach problem — from Hardy-Littlewood, Vinogradov to Helfgott (Survey Talk)
- 11:20 – 12:10 Yoshinori Mishiba (Kyushu University)
Algebraic independence of certain positive characteristic multizeta values
- 13:40 – 14:30 Koji Tasaka (Kyushu University)
Multiple Eisenstein series and Brown's totally odd multiple zeta values
- 14:50 – 15:40 Shin-ichi Yasutomi (Toho University) Jun-ichi Tamura (Tsuda College)
New multidimensional continued fraction algorithms and their applications
- 16:00 – 17:00 Kazuki Morimoto (Osaka City University)
On algebraicity of special values of L -functions for $SO(V) \times GL_2$

December 10 (Tue)

- 9:00 – 10:00 Shun'ichi Yokoyama (Kyushu University)
Exploring Modular Forms using Computer Algebra Systems (Survey Talk)
- 10:15 – 11:05 Shin Hattori (Kyushu University)
Ramification theory and perfectoid spaces
- 11:20 – 12:10 Yoshiyasu Ozeki (RIMS, Kyoto University)
On Galois equivariance of homomorphisms between torsion potentially crystalline representations

- 13:40 – 14:30 Yuichi Hirano (University of Tokyo)
 Congruences of Hilbert modular forms over real quadratic fields
 and the special values of L -functions
- 14:50 – 15:40 Yoshitaka Maeda
 The so-called Maeda conjecture and related topics
- 16:00 – 17:00 Kazuhiro Fujiwara (Nagoya University)
 Indivisibility of relative class numbers for quadratic extensions
 of totally real fields

December 11 (Wed)

- 9:00 – 10:00 Kentaro Nakamura (Hokkaido University)
 The p -adic Langlands correspondence I (Survey Talk)
- 10:15 – 11:05 Sho Yoshikawa (University of Tokyo)
 Roots of the discriminant of an elliptic curves and its torsion
 points
- 11:20 – 12:10 Yasuhiro Terakado (University of Tokyo)
 Determinant of l -adic cohomology of a double covering of a pro-
 jective space and the discriminant of the ramification divisor
- 13:40 – 14:30 Kotaro Sugahara (Kyushu University)
 Arithmetic Cohomology Groups
- 14:50 – 15:50 Takao Yamazaki (Tohoku University)
 p -adic soliton theory and torsion points on Jacobian varieties

December 12 (Thu)

- 9:00 – 10:00 Naoki Imai (University of Tokyo)
 The p -adic Langlands correspondence II (Survey Talk)
- 10:15 – 11:05 Wataru Kai (University of Tokyo)
 A p -adic exponential map for the Picard group and its applica-
 tion to the Albanese map
- 11:20 – 12:10 Hiroyasu Miyazaki (University of Tokyo)
 Special values of zeta functions of varieties over finite fields via
 higher Chow groups
- 13:40 – 14:30 Masatoshi Suzuki (Tokyo Institute of Technology)
 An inverse problem for canonical systems and its applications

- 14:50 – 15:40 Yu Yasufuku (Nihon University)
Arithmetic Properties of Coordinates of Orbit Points
- 16:00 – 17:00 Noriyuki Abe (Hokkaido University)
A classification of irreducible admissible modulo p representations of reductive p -adic groups

December 13 (Fri)

- 9:00 – 10:00 Masato Kurihara (Keio University)
Rubin-Stark conjecture and Rubin-Stark elements (Survey Talk)
- 10:15 – 11:05 Takamichi Sano (Keio University)
A new conjecture for Rubin-Stark elements and its applications
- 11:20 – 12:10 Sachio Ohkawa (University of Tokyo)
On logarithmic nonabelian Hodge theory of higher level in characteristic p
- 13:40 – 14:30 Yuya Matsumoto (University of Tokyo)
Good reduction criterion for K3 surfaces
- 14:50 – 15:40 Keisuke Arai (Tokyo Denki University)
Non-existence of points rational over number fields on Shimura curves
- 16:00 – 17:00 Ahmed Abbes (IHES/CNRS)
The p -adic Simpson correspondence

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