

P-adic method and its applications in arithmetic geometry at Sendai

November 6th, 7th, 2008

Kawai Hall in Mathematical Institute, Tohoku University

<http://www.math.tohoku.ac.jp/~ytakao/conf08.html>

We are organizing a conference on *p*-adic cohomology and *p*-adic analytic geometry. This conference is supported by Grant-in-Aid for Scientific Research(B) (17340008, Representative : Nobuo Tsuzuki). The access to Mathematical Institute, Tohoku University is found in the webpage (<http://www.math.tohoku.ac.jp/access/index.html>).

Program

6th November, Thursday

10:00 – 11:00 Yuki Yoshi Nakkajima (Tokyo Denki)

“Comparison theorem between truncated split cosimplicial weight-filtered crystalline complexes and log de Rham-Witt complexes”

We prove a comparison theorem between truncated split cosimplicial weight-filtered crystalline complexes and log de Rham-Witt complexes. This is a generalization of Illusie-Hyodo-Kato’s theorem. One of the points of the involved proof is to construct a nice truncated bisimplicial exact embedding systems by using Tsuzuki’s Γ -functor.

11:15 – 12:15 Nobuo Tsuzuki (Tohoku)

“Toward Dwork’s conjecture on log-growth of *p*-adic differential equations with Frobenius structures”

We will explain our approach to Dwork’s conjecture on log-growth of *p*-adic differential equations with Frobenius structures. One of the key is the splitting of Frobenius filtration of φ - ∇ -modules with bounded solutions at generic point. (Joint work with Bruno Chiarellotto (Padova))

14:30 – 15:30 Fumiharu Kato (Kyoto)

“Topological rings in rigid geometry”

(Joint-work with Kazuhiro Fujiwara (Nagoya)) A certain class of topological rings is discussed; this class covers all rings that appear in classical rigid geometry by Tate and Raynaud, or in ‘relative rigid spaces’ by Bosch and Lütkebohmert.

15:45 – 16:45 Daniel Caro (Caen)

”Overholonomicity of overconvergence *F*-isocrystals on smooth varieties”

Let *k* be a perfect residue field of characteristic $p > 0$. In order to construct *p*-adic coefficients over *k*-varieties, Berthelot introduced the theory of overconvergent *F*-isocrystals, i.e overconvergent isocrystals with Frobenius structure. Moreover, to get a *p*-adic cohomology over *k*-varieties stable under cohomological operations,

Berthelot built the theory of arithmetic F - \mathcal{D} -modules. In this talk, after recalling some elements of these theories, we introduce the notion of overholonomicity which is a property as stable as the holonomicity in the classical theory of \mathcal{D} -modules. The goal of the talk is to prove the overholonomicity of arithmetic \mathcal{D} -modules associated to overconvergent F -isocrystals over smooth k -varieties. In the proof we need Christol's transfert theorem, a comparison theorem between relative log rigid cohomology and relative rigid cohomology and last but not least Kedlaya's semistable reduction theorem. This is a joint work with Nobuo Tsuzuki.

18:30 – Reception

7th November, Friday

10:00 – 11:00 Shigeki Matsuda (Chiba)

“Arithmetic D -modules corresponding to rank one representations”

We discuss the explicit presentation of the arithmetic D -module corresponding to a rank one representation of the fundamental group.

11:15 – 12:15 Takao Yamazaki (Tohoku)

“Counter examples to variants of the Milnor-Bloch-Kato conjecture”

Galois symbol on semi-abelian varieties has been conjectured to be injective, as a generalization of the Milnor-Bloch-Kato conjecture. After a review on its role in higher dimensional class field theory, I will present a counter example to the injectivity conjecture, and discuss its relation to the theory of motivic cohomology. (Joint work with Michael Spiess.)

14:30 – 15:30 Takeshi Tsuji (Tokyo)

“Nearby cycles and D -modules of log schemes in characteristic $p > 0$ ”

We define and study nearby cycles and D -modules for a log smooth scheme of semi-stable type over a log point of characteristic $p > 0$.

15:45 – 16:45 Atsushi Shiho (Tokyo)

“On logarithmic extension of overconvergent isocrystals”

We establish a criterion for an overconvergent isocrystal on a smooth variety over a field of characteristic $p > 0$ to extend logarithmically to its smooth compactification whose complement is a strict normal crossing divisor. This is a generalization of a result of Kedlaya, who treated the case of unipotent monodromy. Our result is regarded as a p -adic analogue of the theory of canonical extension of regular singular integrable connections.

Organizer : Tsuzuki Nobuo (Tohoku)