p-adic Langlands correspondence and Iwasawa theory

Rapport sur les contributions

https://indico.math.cnrs.fr/e/padiclille2019

ID de Contribution: **1** Type: **Non spécifié**

Geometry of Siegel eigenvarieties at Saito–Kurokawa points

vendredi 26 avril 2019 10:45 (1 heure)

I will report on joint work with T. Berger studying the geometry of Siegel eigenvarieties. Under certain assumptions we show that they are smooth at points corresponding to Saito-Kurokawa lifts when the tame level is paramodular, but singular when it is Gamma_0(N). Moreover, we give an application to the Bloch-Kato conjecture. Our technique uses pseudorepresentations of p-adic families of cuspidal Siegel eigenforms and analytic continuation of crystalline periods.

Orateur: BETINA, Adel

ID de Contribution: **2** Type: **Non spécifié**

An application of a conjecture of Mazur–Tate to supersingular elliptic curves

mercredi 24 avril 2019 14:00 (1 heure)

See the attached document.

Orateur: LECOUTURIER, Emmanuel

ID de Contribution: **3** Type: **Non spécifié**

p-adic cohomology of some period domains

jeudi 25 avril 2019 11:00 (1 heure)

We will explain how to adapt Orlik's computation of the compactly supported l-adic cohomology of many p-adic period domains (l different from p) to the case l=p. The key input is a vanishing theorem for extensions between generalized Steinberg representations of p-adic reductive groups, with coefficients mod p. This is joint work with Pierre Colmez, Julien Hauseux and Wieslawa Niziol.

Orateur: DOSPINESCU, Gabriel

ID de Contribution: **4** Type: **Non spécifié**

Local-global compatibility and the cohomology of locally symmetric spaces

mercredi 24 avril 2019 11:00 (1 heure)

I will discuss joint work with Allen, Calegari, Caraiani, Gee, Helm, Le Hung, Scholze, Taylor and Thorne on potential automorphy for certain compatible systems of Galois representations over CM fields. I will particularly focus on the local-global compatibility results needed to establish our automorphy lifting theorems in the ordinary case and explain the application of a key local ingredient: the computation (due to Hauseux) of derived ordinary parts of parabolically induced representations.

Orateur: NEWTON, James

ID de Contribution: **5** Type: **Non spécifié**

Norm-compatible cohomology classes in Siegel varieties

vendredi 26 avril 2019 09:30 (1 heure)

We will explain how to construct towers of interesting classes in the cohomology of Siegel sixfolds. We will study their complex regulator and we will give an application to Iwasawa theory. This is joint work with Antonio Cauchi and Francesco Lemma.

Orateur: RODRIGUES JACINTO, Joaquin

ID de Contribution: **6** Type: **Non spécifié**

Dilogarithm and higher L invariants for GL3(Qp)

jeudi 25 avril 2019 09:45 (1 heure)

We consider a semi-stable three dimensional p-adic representation ρ of the absolute Galois group of Qp and assume that ρ has rank two monodromy and is non-critical. It is known that ρ depends on three L invariants up to isomorphism. We construct an explicit family of locally analytic representations of GL3(Qp) depending on three invariants and show that there exists a unique representation (conjecturally depends only on ρ) in this family that embeds into a suitable given Hecke eigenspace associated with a global Galois representation whose restriction at p is ρ. We will briefly introduce the construction which involves p-adic dilogarithm and then explain the relation between these representations and previous results by Breuil, Ding and Schraen.

Orateur: QIAN, Zicheng

ID de Contribution: **7** Type: **Non spécifié**

The Serre filtration on mod p Hilbert modular forms of level p

mercredi 24 avril 2019 09:45 (1 heure)

A result of Serre relates the space of mod p modular forms of level Gamma_1(Np) and weight 2 to the spaces of mod p modular forms of level Gamma_1(N) and weight between 2 and p+1. I'll explain a generalization of this to the context of Hilbert modular forms involving a mod p geometric Jacquet-Langlands correspondence. The resulting filtration on mod p Hilbert modular forms of parallel weight 2 and pro-p Iwahori level mirrors the more evident one in cohomology coming from the mod p representation theory of GL_2. This is joint work with P. Kassaei and S. Sasaki.

Orateur: DIAMOND, Fred

ID de Contribution: **8** Type: **Non spécifié**

The eigencurve at Eisenstein weight one points

jeudi 25 avril 2019 14:00 (1 heure)

In this talk, we discuss the geometry of the Coleman-Mazur eigencurve at weight one Eisenstein points. The local nature of the eigencurve is mostly understood at classical points of weight greater than one, while one observes some unusual behaviours at weight one. In particular, we study cuspidal Hida families specializing to Eisenstein series at weight one. Our approach consists in studying the deformation rings of certain (deceptively simple!) Artin representations.
We discuss the implications of our analysis on the classicality of a certain overconvergent eigenspace. Finally, we explain how this Galois-theoretic method yields some new insight on Gross's formula relating the leading term of the p-adic L-function to a Stark unit. This is joint work with Adel Betina and Mladen Dimitrov.

Orateur: POZZI, Alice

ID de Contribution: **9** Type: **Non spécifié**

Hilbert modular eigenvariety at exotic and CM classical points of parallel weight one

jeudi 25 avril 2019 15:30 (1 heure)

We sketch our recent results about the geometry of the p-adic eigenvariety constructed by Andreatta-Iovita-Pilloni, which interpolates Hilbert modular eigenforms over a totally real field F, at classical, regular points of parallel weight one which either are CM or have exotic projective image. To prove these results, we assume the p-adic Schanuel conjecture in most of the cases. The key ingredient in our proof is calculation of the dimension of the tangent spaces of some Galois deformation problems. This talk is based on joint work with A. Betina and F. Fite.

Orateur: DEO, Shaunak

ID de Contribution: **10** Type: **Non spécifié**

On the density of automorphic points in global deformation spaces

vendredi 26 avril 2019 15:00 (1 heure)

I will discuss the problem of the repartition of automorphic points in global polarized deformation spaces. We can ask the problem in terms of fixed level and varying weight or fixed weight and varying level. I will describe positive answers to these problems and their link with the problem of companion p-adic overconvergent automorphic forms.

Orateur: SCHRAEN, Benjamin

ID de Contribution: **11** Type: **Non spécifié**

On the Hilbert cuspidal eigenvariety at weight one Eisenstein points

jeudi 25 avril 2019 16:45 (1 heure)

When the p-adic L-function of a finite order totally odd character \phi of a totally real field F has trivial zeros, any p-stabilization of the corresponding weight one Eisenstein series belongs to the Hilbert cuspidal eigencurve. In the case of elliptic modular forms, it was proved by Betina-Dimitrov-Pozzi that such points are etale over the weight space, hence belong to a unique cuspidal Hida family. In this talk, we will first present a generalisation to a real quadratic field in which p splits.

The complexity of the geometry of the Hilbert cuspidal eigencurve at such points growing with the dimension of H^1(F,\phi) which equals the degree of F, a challenging question is to determine the extension classes occurring in Galois representations attached to cuspidal Hida families. We will provide a partial answer in the case when p is inert in F and satisfied the Leopoldt conjecture. A key step of our work is to construct p-ordinary irreducible Galois representations with values in certain local rings of the eigencurve.

As an application, we give a new proof of the rank one abelian Gross-Stark conjecture relating the leading term of p-adic L-function of \phi and a non-zero algebraic L-invariant. This conjecture was first proved by Dasgupta-Darmon-Pollack under the assumption that a sum of two analytic L-invariances is non-zero. This is an ongoing work with Adel Betina and Mladen Dimitrov.

Orateur: SHIH, Sheng-Chi

ID de Contribution: **12** Type: **Non spécifié**

On extra zeros of p-adic L-functions

mercredi 24 avril 2019 15:30 (1 heure)

See the attached document.

Orateur: BENOIS, Denis

ID de Contribution: **13** Type: **Non spécifié**

On the geometry of Pappas–Rapoport Shimura varieties

vendredi 26 avril 2019 13:30 (1 heure)

After recalling the geometry of the special fiber of the modular curve, I will talk about possible generalizations to Shimura varieties.
I will explain why the situation is more involved when ramification appears, and why one is led to use models defined by Pappas and Rapoport. I will then define an analogous of the ordinary locus in this context.
This is joint work with V. Hernandez.

Orateur: BIJAKOWSKI, Stéphane