Universität Duisburg-Essen WS 2008

Arbeitsgemeinschaft
On the Trace formula over local fields

Organisation: Manuel Blickle, Hélène Esnault, Do 14:15–16:15, T03R04D10

Programme of the seminar

The goal of the seminar is to study nearby cycles as a motivic class in an appropriate Grothendieck group and to study a trace formula for counting unramified points.

16.10.08 **1. Small course on the Grothendieck ring of varieties I**
Eckart Viehweg

23.10.08 **2. Small course on the Grothendieck ring of varieties II**.
Hélène Esnault
Definition of $K_0(Var_k)$, presentation when char. $k = 0$ [Bi], morphism to $\mathbb{Z}[SB]$ [LaLu], definition of $\mathcal{M}_k$ for k a field, basic properties: torsion [Po], [Ko], motivic zeta function, regulator to $K_0(Mot^{eff})$ and $K_0(Mot)$ [A, Chap. 13], Euler characteristic and Hodge polynomial.

30.10.08 **3. Small course in formal geometry**
Chapters 1-2-3-4 of [Il] Doan Trung Cuong

06.11.08 **4. Small course in formal and rigid geometry**
Chapters 3-4-5 of [Ni1] and references there. Georg Hein

13.11.08 **5. Small course in formal and rigid geometry II**
Georg Hein

20.11.08 **6. Small course in geometry: weak Néron model**
[Ni2, Section 3-4] Holger Partsch

27.11.08 **7. Small course in geometry: weak Néron model II**
Christian Liedtke

04.12.08 **8. Motivic zeta function**
[Ni3, Sections 1-2] and references there. In particular: Arc spaces [Lo, Intro]. Equivariant Grothendieck ring [Lo, Section 5.1]. Motivic zeta function [DeLo3].
Angela Ortega

11.12.08 **9. Motivic nearby cycles, motivic volume**
[Ni3, Sections 3-4] and references there, also [Bi2]. Kay Rülling

18.12.08 **10. Semi-stable model, motivic Serre invariant**
[Ni3, Sections 6-7], [Ni2, Section 5], [LoSeb, Section 4.5]. Andre Chatzistamatiou

08.01.09 **11. Johannes Nicaise will be in Essen and will lecture**
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15.01.09 **12. (Tame) Trace formula**
[Ni2, Section 6] Stefan Kukulies

22.01.09 **13.**
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29.01.09 **14.**
After [Ni2] ??

References

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[Bi] Bittner, F.: The universal Euler characteristic for varieties of characteristic zero, Compositio. math. **140** (2004), 1011-1032.

[Bi2] Bittner, F.: On motivic zeta functions and motivic nearby fiber, Math. Z. **249** (2005), 63-83.

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[DeLo1] Denef, J.; Loeser, F.: Motivic Igusa zeta function, J. Alg. Geom. **7** (1998), no 3, 505-537.

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[DeLo4] Denef, J.; Loeser, F.: Motivic integration, quotient singularities and the McKay correspondence, Compositio math. **131** (2002), no3, 267-290.

[Il] Illusie, L.: Grothendieck's existence theorem in formal geometry. With a letter (in French) of Jean-Pierre Serre. Math. Surveys Monogr., **123**, Fundamental algebraic geometry, 179–233, Amer. Math. Soc., Providence, RI, 2005.

[Ko] Kollár, J.: Conics in the Grothendieck ring, Adv. Maths. **198** (2005), 27-35.

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[LoSeb] Loeser, F.; Sebag, L.: Motivic integration on smooth rigid varieties and invariants of degeneration, Duke Math. J. **119** (2003), 315-344.

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[Ni1] Nicaise, J.: Formal and rigid geometry: an intuitive introduction, and some applications, arXiv.

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[Ni2] Nicaise, J.: A trace formula for varieties over discrete valued fields, arXiv.

[Ni3] Nicaise, J.: Motivic nearby cycles, privat, sent to H. Esnault.

[Po] B. Poonen: The Grothendieck ring of a variety is not a domain, Math. Res. Lett. **9** (2002), 493-498.