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A. 研究概要

正標数の代数多様体上のエタール層の特性サイクルを研究した。特異台の順像の次元が射の行き先の次元と一致する場合に、固有射による順像との両立性が昨年証明できたので、論文を書いて投稿した。

離散付値体の分岐群の定義を大域化し、一般の付値環についても拡大体の整数環が完全交叉という強い条件を仮定すれば、同じ方法で分岐群が定義できることを証明した。混標数の場合の非対数的分岐群の次数商は課題として残った。

I studied the characteristic cycle of an étale sheaf on a variety in positive characteristic. I completed and submitted an article on the compatibility with proper direct image under the assumption that the dimension of the direct image of the singular support equals that of the target space, proved last year.

I globalized the definition of the filtration by ramification groups of a local field and generalized the definition to a general valuation field under the assumption that the integer rings of extension fields are of complete intersection. The problem of the graded pieces in the mixed characteristic and non logarithmic case remains to be studied.

B. 発表論文

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2. T. Saito “Characteristic cycle of the external product of constructible sheaves”, *Manuscripta Mathematica*, 154, Issue 1-2, 2017, pp 1-12.
3. T. Saito “Wild ramification and the cotangent bundle”, *Journal of Algebraic Geometry*, 26 (2017), 399-473.
4. T. Saito “The characteristic cycle and the singular support of a constructible sheaf”, *Inventiones mathematicae*, 207(2), (2017) 597-695,

5. T. Saito “Characteristic cycle and the Euler number of a constructible sheaf on a surface”, *Kodaira Centennial issue of the Journal of Mathematical Sciences*, the University of Tokyo, vol 22, (2015), 387-442.
6. K. Kato and T. Saito “Ramification theory for varieties over a local field,” *Publications Mathematiques, IHES*. 117, Issue 1 (2013), 1-178
7. T. Saito “The second Stiefel-Whitney classes of ℓ -adic cohomology,” *Journal für die reine und angewandte Mathematik*, (2013), Issue 681, 101-147.

C. 口頭発表

1. Characteristic cycles and the conductor of direct image, *Interactions between Representation Theory and Algebraic Geometry*, the University of Chicago, August 22, 2017 (アメリカ), p 進コホモロジーと数論幾何学, 東京電機大学 11月16日, *The Legacy of Carl Friedrich Gauss*, Dec 18, 2017, *TSIMF*, Sanya, (中国) .
2. Characteristic cycle of an ℓ -adic sheaf, 数学会総合分科会, 特別講演, 関西大学, 9月17日, 東北大学代数セミナー 1月26日, 第12回 鹿児島 代数・解析・幾何学セミナー 2月13日, *JAMI 2017 Local zeta functions and the arithmetic of moduli spaces: A conference in memory of Jun-ichi Igusa* March 22-26, 2017 *Johns Hopkins University* (アメリカ), *Fukuoka International Conference on Arithmetic Geometry in 2017* April 20, (日本). *Workshop on arithmetic geometry at Tambara* 2017 May 22, (日本) . *Algebraic Analysis in honor of Masaki Kashiwara’s 70th birthday* IHES, June 9 2017 (フランス) . *Algebraic Analysis and Representation Theory – In honor of Professor Masaki Kashiwara’s 70th Birthday – RIMS* June 28 (日本) . *Regulators in Niseko* 2017, 2017年9月4日.
3. On the characteristic cycle of a constructible sheaf, *SAGA Orsay*, 22/03/16,

- (フランス) . Hakodate workshop on arithmetic geometry 2016. Hakodate arena. (日本) 6月1日, Tokyo-Seoul at KIAS, June 16-17, (韓国) . PANT Characteristic cycle of a constructible sheaf, July 11-15 (台湾) .
4. The characteristic cycle and the singular support of an étale sheaf, Workshop of arithmetic geometry in Tohoku, October 30, 2014 (日本) . Arithmetic and Algebraic Geometry (Shioda 75), UTokyo, School of Math. Sci., Lecture hall, January 31, 2015, (日本) . Séminaire Théorie des Nombres, Institute de Mathématique de Bordeaux, mars 20, 2015, Arithmetic Algebraic Geometry, May 15, 2015 (中国) . Nordic Number-theory Network, Copenhagen June 16, (デンマーク) . Géométrie arithmétique, théorie des représentations et applications, 24 juin 2015, (フランス) . Guest seminar, Freie Universität Berlin, June 30 12:30-14:00 16:00-17:30, July 2, 7 (ドイツ) . AMS algebraic geometry summer institute, July 27, 2015, (アメリカ) . Conference on Algebraic Number Theory, TSIMF Sanya, January 17, 2016, (中国) .
 5. On the characteristic cycle of an ℓ -adic sheaf, Journées de géométrie arithmétique de l'IHÉS 25-26 septembre 2014 IHÉS(フランス), 25.
 6. ℓ 進層の分岐と特性多様体、第三回九州合同セミナー 2014年1月11日 佐賀大学, Characteristic cycles of a constructible sheaf on a surface, Arithmetic and Algebraic Geometry 2014, 東大数理大講義室 2014年1月29日, Conference on Motives and Galois groups on the occasion of Uwe Jannsen's 60th birthday, March 12 14:00-15:00, 2014, University of Regensburg(ドイツ). Geometry and Arithmetic of Surfaces, March 18 10:00-11:00, 2014 LMU and TU Munich(ドイツ).
 7. The monodromy weight conjecture and perfectoid spaces (after Peter Scholze), VI-ASM Annual Meeting 2013, Hanoi, July 20-21, 2012. (ヴェトナム)
 8. Wild ramification and the cotangent bundle, 25/01/13 KIAS number theory seminar, 20/02/13 IPMU Inter-disciplinary Colloquium, 13/03/13 IHES Seminaire de mathematiques, 19/03/13 ENS a Lyon, 03/07/13 AMC 2013, Busan, 24/07/13 PANT (Pan Asia Number Theory) conference, VIASM, (ヴェトナム)
- D. 講義
1. 微分積分学 (A セメスター) : 微積分 (教養学部1年生)
 2. 代数学3 : 体とガロワ理論 (数学科3年生)
- E. 修士・博士論文
1. (修士) 河内谷 耀一 (KAWACHIYA Yoichi): 有限体上の代数曲線から得られる線型符号について
 2. (修士) 竹内 大智 (TAKEUCHI Daichi): Blow-ups and the class field theory for curves
- F. 対外研究サービス
1. 第19, 20回高木レクチャー 7月8,9日, 11月4日オーガナイザー
 2. Workshop on arithmetic geometry at Tambara 2017, 5月22日(月)-5月25日(木) オーガナイザー
 3. Journal of Algebraic Geometry, エディター
 4. Documenta Mathematica, エディター
 5. Japanese Journal of Mathematics, エディター