

GCOE レクチャーズ
グローバル COE プログラム「数学新展開の研究教育拠点」

DATE & PLACE Lecture 1: January 8 (Thu), 2009, 17:00–18:00, Room 123
 Lecture 2: January 9 (Fri), 2009, 17:00–18:00, Room 123
 Lecture 3: January 22 (Thu), 2009, 17:00–18:00, Room 370
 Lecture 4: January 23 (Fri), 2009, 17:00–18:00, Room 370
 Graduate School of Mathematical Sciences, the University of Tokyo

SPEAKER **Eric Opdam** (University of Amsterdam)

TITLE The spectral category of Hecke algebras and applications
 Lecture 1: Reductive p -adic groups and Hecke algebras.
 Lecture 2: Affine Hecke algebras and harmonic analysis.
 Lecture 3: The spectral category and correspondences of tempered representations.
 Lecture 4: Example: Lusztig’s unipotent representations for classical groups.

ABSTRACT 大学院生・若手研究者を対象とした連続講義です。

Hecke algebras play an important role in the harmonic analysis of a p -adic reductive group. On the other hand, their representation theory and harmonic analysis can be described almost completely explicitly. This makes affine Hecke algebras an ideal tool to study the harmonic analysis of p -adic groups. We will illustrate this in this series of lectures by explaining how various components of the Bernstein center contribute to the level-0 L -packets of tempered representations, purely from the point of view of harmonic analysis.

We define a “spectral category” of (affine) Hecke algebras. The morphisms in this category are not algebra morphisms but are affine morphisms between the associated tori of unramified characters, which are compatible with respect to the so-called Harish-Chandra μ -functions. We show that such a morphism generates a Plancherel measure preserving correspondence between the tempered spectra of the two Hecke algebras involved. We will discuss typical examples of spectral morphisms.

We apply the spectral correspondences of affine Hecke algebras to level-0 representations of a quasi-split simple p -adic group. We will concentrate on the example of the special orthogonal groups $SO_{2n+1}(K)$. We show that all affine Hecke algebras which arise in this context admit a *unique* spectral morphism to the Iwahori-Matsumoto Hecke algebra, a remarkable phenomenon that is crucial for this method. We will recover in this way Lusztig’s classification of “unipotent” representations.

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<http://www.ms.u-tokyo.ac.jp/~toshi/seminar/ut-seminar.html>