

Shanghai Workshop on Representation Theory and Complex Analysis

(November 11 ~ 12, 2009)

PLACE: **November 11th**
Lecture room 102
Department of Mathematics
East China Normal University

November 12th
107 Zhi Yuan Lou
Department of Mathematics
Tongji University

November 11th (Wed)

- 9:30 - 10:20 Xiaoming Wang (East China Normal Univ.)
Tight Monomials for the Quantum Enveloping Algebras
- 10:30 - 11:20 Mei Si (Shanghai Jiaotong Univ.)
Blocks of Birman-Murakami-Wenzl algebras
- 11:30 - 12:20 Kentaro Wada (Nagoya Univ.)
Presenting cyclotomic q -Schur algebras
- 14:00 - 14:50 Pu Zhang (Shanghai Jiaotong Univ.)
Representations theory of Gorenstein-projectives
- 15:00 - 15:50 Osamu Iyama (Nagoya Univ.)
Stable categories of higher preprojective algebras
- 16:00 - 16:50 Hyohe Miyachi (Nagoya Univ.)
On an equivalence between the category \mathcal{O} over a certain rational
Cherednik algebra and a module category of a cyclotomic Schur algebra
- 17:00 - 17:50 Toshiaki Shoji (Nagoya Univ.)
Foldings of Hecke algebras associated to non-crystallographic Coxster groups

November 12th (Thu)

- 9:00 - 9:50 Bo-Yong Chen (Tongji Univ.)
Comparison of the Bergman and Szego kernels
- 10:00 - 10:50 Takeo Ohsawa (Nagoya Univ.)
On the sequence Bergman metrics along the towers
of certain Riemann surfaces
- 11:00 - 11:30 Yanyan Wang (Nagoya Univ.)
On Krushkal's proof of the de Branges-Bieberbach theorem

- 11:40 - 12:10 Atsushi Yamamori (Nagoya Univ.)
The Bergman kernel of a certain Hartogs domain
- 14:00 - 14:50 Yan Qiming (Tongji Univ.)
Uniqueness problem with truncated multiplicities
of meromorphic mappings from \mathbb{C}^n into $\mathbb{P}^N(\mathbb{C})$
- 15:00 - 15:50 Hideyuki Ishi (Nagoya Univ.)
An integral formula for powers of the Bergman kernel
on bounded homogeneous representative domain
- 16:00 - 16:50 Qiang Fu (Tongji University)
A double Hall algebra approach to affine quantum Schur-Weyl theory
- 17:00 - 17:50 Quanshui Wu (Fudan Univ.)
AS-regular Hopf algebras and Calabi-Yau Hopf algebras
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Abstracts

Xiaoming Wang (East China Normal Univ.)

Tight Monomials for the Quantum Enveloping Algebras

The global crystal basis or canonical basis plays an important role in the theory of quantum groups and their representations. However, it is difficult to determine the canonical basis explicitly. Based on Lusztig, Marsh, Reineke, Deng and Du's work, we discuss the tight monomials in the canonical basis and determine the tight monomials for the quantum enveloping algebras associated to the Cartan matrices with rank 2.

Mei Si (Shanghai Jiaotong Univ.)

Blocks of Birman-Murakami-Wenzl algebras

Birman, Wenzl and independently Murakami introduced a class of finite dimensional algebras \mathcal{W}_n , which are known as the Birman-Murakami-Wenzl algebras or BMW-algebras. When the ground field κ contains invertible r and q such that $o(q^2) > n$ and $\text{Char } \kappa \neq 2$, we determine the structure of the cell module $\Delta(1, \lambda)$ of \mathcal{W}_n where λ is any partition of $n - 2$. In particular, we compute the dimension of the simple head of $\Delta(1, \lambda)$. Cox, Visscher and Martin have classified the blocks of Brauer algebras B_n in characteristic zero. We solve the similar problem for \mathcal{W}_n over the aforementioned field κ . As a by-product, we give a criterion for each module of \mathcal{W}_n being equal to its simple head over an arbitrary field. This is a joint work with H. Rui

Kentaro Wada (Nagoya Univ.)

Presenting cyclotomic q -Schur algebras

The cyclotomic q -Schur algebra S associated to the Ariki-Koike algebra H is defined as the endomorphism algebra of a certain H -module. In my talk, we introduce a certain "big" algebra \tilde{U}_q such that a quantum group of gl_m is a quotient algebra of \tilde{U}_q . After that, we realize S as a quotient algebra of \tilde{U}_q , and we give a presentation of S by generators and fundamental relations.

Pu Zhang (Shanghai Jiaotong Univ.)

Representations theory of Gorenstein-projectives

In this talk we study representations theory induced by Gorenstein-projectives, mainly over Iwanaga-Gorenstein algebras. We will give a sufficient and necessary condition for CM-finite Gorenstein algebras; determine all the Gorenstein-projective modules over T_2 extensions of Gorenstein algebras. We will also introduce and study the Gorenstein derived categories of an algebra

Osamu Iyama (Nagoya Univ.)

Stable categories of higher preprojective algebras

(joint work with S. Oppermann)

The notion of n -representation-finiteness appears in higher analogue of Auslander-Reiten theory as a natural generalization of classical representation-finiteness. For each n -representation-finite algebra A , we have the associated $(n + 1)$ -preprojective algebra B , which is finite dimensional and selfinjective. The stable module category $\underline{\text{mod}}B$ is shown to be an $(n + 1)$ -Calabi-Yau triangulated category. Our main result shows that it is equivalent to the generalized $(n + 1)$ -cluster category (in the sense of Amiot) of the stable n -Auslander algebra of A .

Also we will show that these results still hold if the assumption of n -representation-finiteness on A is weakened to a less restrictive vanishing property of the extension groups, which in particular always holds for $n = 2$. In this case we deal with the stable category of Cohen-Macaulay modules $\underline{\text{CM}}B$ instead of $\underline{\text{mod}}B$.

Hyohe Miyachi (Nagoya Univ.)

On an equivalence between the category \mathcal{O} over a certain rational Cherednik algebra and a module category of a cyclotomic Schur algebra

(joint work with J. Chuang)

For a certain choice of multicharge (dominant multicharge), we shall obtain an identification between categories in the title. Here, the case where we are dealing with is not covered by Rouquier's beautiful general theory of quasihereditary covers since the Hom-space between standards is different from the corresponding Hom-space between Specht's.

Toshiaki Shoji (Nagoya Univ.)

Foldings of Hecke algebras associated to non-crystallographic Coxeter groups

Let W_0 be a Coxeter group of type H_2, H_3 or H_4 . Then W_0 is obtained, by the exceptional folding of root systems, as a subgroup of a Weyl group W of type A_4, D_6 or E_8 . Correspondingly, one can consider the Hecke algebra $\mathcal{H}(W)$ associated to W , and the Hecke algebra $\mathcal{H}(W_0)$ associated to W_0 . In this talk, we discuss the relationship between $\mathcal{H}(W)$ and $\mathcal{H}(W_0)$.

Bo-Yong Chen (Tongji Univ.)

Comparison of the Bergman and Szego kernels

We obtain almost "sharp" comparison of the Bergman and Szego kernels for a large class of weakly pseudoconvex domains together with a sharp result for bounded convex domains.

Takeo Ohsawa (Nagoya Univ.)

On the sequence Bergman metrics along the towers of certain Riemann surfaces

It is shown that, for any Fuchsian group Γ acting on the complex upper half plane \mathbf{H} such that \mathbf{H}/Γ is a compact hyperelliptic Riemann surface, there exists a sequence of subgroups $\Gamma(n) \subset \Gamma$ ($n = 1, 2, 3, \dots$) satisfying $\Gamma(1) = \Gamma$ and $\bigcap_n \Gamma(n) = \{\text{id}\}$ such that the associated sequence of the Bergman metrics of $\mathbf{H}/\Gamma(n)$, pulled back to \mathbf{H} , does not converge to the Bergman metric of \mathbf{H} .

Yanyan Wang (Nagoya Univ.)

On Krushkal's proof of the de Branges-Bieberbach theorem

It was conjectured by Bieberbach and proved by de Branges that the n -th Taylor coefficient a_n of any univalent holomorphic function f on the unit disc satisfying $f(0) = 0$ and $f'(0) = 1$ satisfies $|a_n| \leq n$. We shall review a new approach to the proof of this result following a recent paper of S. Krushkal.

Atsushi Yamamori (Nagoya Univ.)

The Bergman kernel of a certain Hartogs domain parWe consider a certain Hartogs domain which is related to Fock-Bargmann space. We give an explicit formula for the Bergman kernel of the domain in terms of the polylogarithm function. Moreover we solve the Lu Qikeng problem for the domain in some case.

Yan Qiming (Tongji Univ.)

Uniqueness problem with truncated multiplicities of meromorphic mappings from \mathbb{C}^n into $\mathbb{P}^N(\mathbb{C})$

Hideyuki Ishi (Nagoya Univ.)

An integral formula for powers of the Bergman kernel on bounded homogeneous representative domain

We expect that the representative domain should be a canonical realization of a bounded homogeneous domain. In this talk, we compute the integral of powers of the Bergman kernel on the domain, so that we obtain a generalization of the Hua polynomial for bounded symmetric domains.

Qiang Fu (Tongji Univ.)

A double Hall algebra approach to affine quantum Schur-Weyl theory

(joint work with B. Deng and J. Du)

Through the Ringel-Hall algebra realization of the \pm -part of quantum enveloping algebra associated with symmetrizable Cartan matrices is an important breakthrough in the nineties, especially for the introduction of the geometric approach to the theory, the same problem for the entire groups is far from completion. However, Beilinson-Lusztig-MacPherson (BLM) solved the problem for quantum \mathfrak{gl}_n by exploring further properties coming out from the quantum Schur-Weyl reciprocity. We will study the realization problem of quantum affine \mathfrak{gl}_n .

Quanshui Wu (Fudan Univ.)

AS-regular Hopf algebras and Calabi-Yau Hopf algebras

I will survey the progress on the homological aspects of noetherian Hopf algebras/quantum groups in the talk. Some classification results of noetherian Hopf algebras with low dimensional GK -dimension will also be discussed.

For the information of the workshop, please contact to

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