

ISSN 1881-6193

**RIMS Kôkyûroku Bessatsu B20**

*New Viewpoints of Representation Theory  
and Noncommutative Harmonic Analysis*

edited by Minoru Itoh and Hiroyuki Gohiaï

October, 2010

Research Institute for Mathematical Sciences

Kyoto University

*RIMS Kôkyûroku Bessatsu B20*

*New Viewpoints of Representation Theory  
and  
Noncommutative Harmonic Analysis*

*September 16 ~19, 2008*

*edited by Minoru Itoh and Hiroyuki Ochiai*

*October, 2010*

*Research Institute for Mathematical Sciences*

*Kyoto University, Kyoto, Japan*

The papers presented in this volume of RIMS Kôkyûroku Bessatsu are in final form and refereed.  
©2010 by the Research Institute for Mathematical Sciences, Kyoto University. All rights reserved.  
Printed in Japan.

## Preface

This volume of RIMS Kôkyûroku Bessatsu is the proceedings of the RIMS workshop

### **New Viewpoints of Representation Theory and Noncommutative Harmonic Analysis**

held from September 16 through September 19, 2008.

In this workshop, 16 speakers talked about their recent research on representation theory and noncommutative harmonic analysis, and this volume collects 13 contributions from the speakers. These papers are all refereed.

We would like to thank all the participants, and in particular speakers and anonymous referees. We also thank the staffs of RIMS for their kind and efficient support for the workshop and this proceedings.

August 2010

Minoru Itoh (Kagoshima University)  
Hiroyuki Ochiai (Kyushu University)

## Contents

1. Kyo NISHIYAMA (西山享) ..... 1  
A study of asymptotic cones and degenerate principal series  
(漸近錐と退化主系列表現)
2. Katsuyuki NAOI (直井克之) ..... 21  
On the construction of extended affine Lie algebras using finite order automorphisms  
(有限位数自己同型を用いた extended affine Lie algebra の構成について)
3. Noriyuki ABE (阿部紀行) ..... 31  
Duflo-Zelobenko 4-term exact sequence and homomorphisms between principal series
4. Sho MATSUMOTO (松本詔) ..... 39  
A limit theorem for the Jack deformation of Plancherel measures  
(プランシェレル測度のジャック版の極限定理)
5. Takayuki OKUDA (奥田隆幸) ..... 57  
Relation between zeta polynomials and differential operators on some invariant rings  
(不変式環における zeta 多項式と微分作用素の関係について)
6. Katsuhiko KIKUCHI (菊地克彦) ..... 71  
Invariant polynomials for multiplicity-free actions of rank four  
(階数 4 の multiplicity-free 作用に関する不変式)
7. Atsumu SASAKI (笹木集夢) ..... 95  
Linear visible actions
8. Tadashi MIYAZAKI (宮崎直) ..... 103  
Whittaker functions for generalized principal series representations of  $SL(3, \mathbf{R})$   
( $SL(3, \mathbf{R})$  の一般主系列表現の Whittaker 関数の明示公式)
9. Yasuko HASEGAWA (長谷川泰子) ..... 111  
Principal series Whittaker functions on the real symplectic group of rank 2
10. Kazuki HIROE (廣恵一希) ..... 119  
Generalized Whittaker functions for degenerate principal series of  $GL(4, \mathbf{R})$
11. Toshio OSHIMA (大島利雄) and Nobukazu SHIMENO (示野信一) ..... 129  
Heckman-Opdam hypergeometric functions and their specializations

12. Atsushi YAMAMORI (山盛厚伺) .....	163
Generalized Laplacians on classical domains	
13. Hideyuki ISHI (伊師英之) .....	173
Continuous wavelet transforms and non-commutative Fourier analysis	