ISSN 1881-6193

RIMS Kôkyûroku Bessatsu B27

Spectra of Random Operators and Related Topics

edited by Nariyuki Minami

July, 2011
Research Institute for Mathematical Sciences
Kyoto University

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Preface

This volume of RIMS Kôkyûroku Bessatsu consists of research papers and survey articles contributed by speakers in the RIMS workshop "Spectra of Random Operators and Related Topics", which was held at Kyoto University from December 2 through 4 in 2009, and was organized by Naomasa Ueki (Kyoto University) and Nariyuki Minami (Keio University).

Spectral properties of random operators, especially Schrödinger operators with random potentials, had been studied mainly in relation to Anderson localization. But recently, several examples of random operators were successfully analyzed, to yield rigorous results on *spectral statistics*, which is an interesting common issue shared by random matrix theory and theory of quantum chaos. On the other hand, fifty years have passed since the publication of P.W. Anderson's monumental work, *Absence of diffusion in certain random lattices*, in which "Anderson localization"for disordered Hamiltonians was first conjectured. During this half century, however, mathematics and condensed matter physics of Anderson localization developed rather independently, without substantial interactions. For better future understanding of disordered systems, it is desirable to fill the gap between physicists and mathematicians. It was from these perspectives that in addition to reports on random Schrödinger operators, reports on quantum chaos and on probabilistic questions related to random matrices, and a report from condensed matter physicists, were collected in this volume.

The speakers of the workshop from abroad were invited by Shu Nakamura (Tokyo University) to lecture at "Kochi School on Random Schrödinger Operators", which was held at Kochi University from November 26 through 28, and then extended their stay in Japan to participate our workshop. I am grateful to RIMS and Professor Nakamura for financial support, and to Professor Ueki for collaboration.

Yokohama,
June 2011

Nariyuki MINAMI
Keio University

Spectra of Random Operators and Related Topics

- December 2-4, 2009
- Yoshida-South Campus Bldg.4, 2nd floor room 20, Kyoto University

Organaized by
Nariyuki MINAMI (Keio University)
Naomasa UEKI (Kyoto University)

Program

Dec. 2 (Wed.)

10:00–10:50 N. Minami (Keio University)
Energy level statistics for the one-dimensional Anderson model

11:00–11:50 F. Germinet (Université de Cergy-Pontoise)
Quantization of edge currents along magnetic barriers and magnetic guides

11:50–13:30 lunch break

13:30–14:20 P. Müller (Unversität München)
On the spectral shift function of compactly supported perturbation

14:30–15:20 S. Kotani (Kwansei Gakuin University)
Limit distribution of eigenvalues spacing for Scrödinger operators with random decaying potentials

15:20–15:40 tea break

15:40–16:30 F. Nakano (Kochi University)
On energy level statistics at low energy

16:40–17:30 F. Klopp (Université Paris 13)
The structure of the solutions to quasi-periodic finite difference equations in the large coupling regime (based on joint work with A. Fedotov)

Dec. 3 (Thurs.)

9:30–10:20 J.-M. Combes (Université du Sud: Toulon et le Var)
Spectral Correlations for the Discrete Anderson model

10:30–11:20 A. Klein (University of California, Irvine)
Local Wegner estimates, Minami estimates, and Poisson statistics of eigenvalues for continuum Anderson Hamiltonians

11:30–12:20 K. Slevin (Osaka University)
Finite size scaling analysis of the Chalker-Coddington model

12:20–14:00 lunch break

14:00–14:50 T. Nagao (Nagoya University)
Determinantal spectral correlations for chaotic systems

15:00–15:50 T. Sasamoto (Chiba University)
Maximum of Dyson BM and Dyson BM with boundary

15:50–16:10 tea break

16:10–17:00 S. Hikami (University of Tokyo)
Correlations at a spectrum edge of a random matrix

Dec. 4 (Fri.)

10:00–10:50 M. Katori (Chuo University)
Dyson's Brownian motion model with $\beta = 2$ and entire functions
(joint work with H. Tanemura)

11:00–11:50 N. Sakuma (Keio University)
Free additive infinite divisibility of free multiplicative convolutions with the Wigner measure, with examples

11:50–13:30 lunch brerak

13:30–14:20 Y. Kitagaki (Kyoto University)
Generalized eigenvalue-counting estimates for some random accoustic operators

14:30–15:20 N. Ueki (Kyoto University)
Lifschitz tails for the uniform magnetic field and a randomly perturbed lattice

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