

Spectra of Random Operators and Related Topics

ランダム作用素のスペクトルと関連する話題

- December 10-12, 2015; 平成 27 年 12 月 10 日 (木) – 12 日 (土)
- Keio University (Hiyoshi Campus), Building “Raiosha”, Conference Room M.
慶應義塾大学 (日吉キャンパス) 来往舎中会議室

世話人：中野史彦 (学習院大学)
南 就将 (慶應義塾大学)
連絡責任者：南就将 minami@a5.keio.jp

Organized by:
Fumihiko Nakano (Gakushuin University)
Nariyuki Minami (Keio University)
Contact to Nariyuki Minami: minami@a5.keio.jp

Program

12 月 10 日 (木) /December 10

10:00-10:50 Fumihiko Nakano (Gakushuin University, Tokyo, Japan)

Poisson statistics for 1d Schroedinger operators with random decaying potential.

11:00-11:50 Dhriti Ranjan Dolai (Institute of Mathematical Sciences, Chennai, India)

Spectral statistics of random Schrödinger operators with unbounded potentials.

11:50-13:30 Lunch Break

13:30-14:20 Christopher Shirley (Université Libre de Bruxelles, Brussels, Belgium)

Spectral statistics for one-dimensional random operators.

14:30-15:20 Christian Sadel (Institute of Science and Technology, Klosterneuburg, Austria)

SDE limit for products of random matrices and GOE limit for Anderson model on long strips. (joint with B. Virag)

15:40-16:30 Shin'ichi Kotani (Osaka University, Osaka, Japan)

Transformation of Herglotz functions and KdV equation II.

16:40-17:30 Tohru Koma (Gakushuin University, Tokyo, Japan)

Quantization of conductance in quasi-periodic quantum wires.

12月11日（金）/December 11

10:00–10:50 Takuya Mine (Kyoto Institute of Technology, Kyoto, Japan)

Trace formula for the Aharonov-Bohm magnetic fields.

11:00–11:50 Frédéric Klopp (Université Pierre et Marie Curie, Paris, France)

Resonances for large ergodic systems.

11:50–13:30 Lunch Break

13:30–14:20 Keith Slevin (Osaka University, Osaka, Japan)

Numerical simulation of the Anderson-Heisenberg model.

14:30–15:20 Tomi Ohtsuki (Sophia University, Tokyo, Japan)

Disordered Chern insulator and Weyl semimetal.

15:40–16:30 Taro Kimura (Keio University, Yokohama, Japan)

Matrix integral and representation theory: a physical point of view.

16:40–17:30 Trinh Khanh Duy (Kyushu University, Fukuoka, Japan)

Spectral measures of random Jacobi matrices associated with Gaussian and Wishart beta ensembles.

12月12日（土）/December 12

10:00–10:50 Tomohiro Sasamoto (Tokyo Institute of Technology, Tokyo, Japan)

Stochastic dualities for asymmetric interacting particle systems.

11:00–11:50 Taro Nagao (Nagoya University, Nagoya, Japan)

Replica analysis of directed scale-free networks

12:00–12:50 Makoto Katori (Chuo University, Tokyo, Japan)

Noncolliding pinned Brownian motions.

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(November 29, 2015)

Abstracts

Kimura, Taro: Matrix integral and representation theory: a physical point of view.

We discuss the unitary matrix integral, especially from a physical point of view. This integral is potentially connected with representation theory, and typically applied to Chern-Simons theory, knot theory, and their generalizations. This talk is partly based on arXiv:1408.0020 and arXiv:1503.01462.

Klopp, Frédéric: Resonances for large ergodic systems.

In this talk, we consider one dimensional discrete Schrödinger operators with a potential that is the restriction of an ergodic potential to a large interval. We study the resonances i.e. the poles of the scattering matrix of this operator in the limit when the size of the interval goes to infinity. Depending on the characteristics of the limit ergodic Schrödinger operator, the resonances, in particular, the resonances widths, exhibit very different behaviors. We will concentrate on two types of ergodic potentials, periodic ones and homogeneous random ones.

Sadel, Christian: SDE limit for products of random matrices and GOE limit for Anderson model on long strips.

We consider products of i.i.d. random matrices that are small perturbations of a fixed matrix T_0 . After projecting out the fast growing directions by taking a Schur complement we find a limiting continuous time process in a critical scaling. This limit can be described by an SDE. Applied to the transfer matrices of random Schrödinger operators on strips one can describe the limiting point process of the eigenvalues in this scaling. Introducing some further scaling one can connect to a random matrix ensemble. Finally one can obtain GOE type statistics along certain subsequences of disorder parameter, length and width of the strip where length and width parameter go to infinity and the disorder to zero.