

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

- January 9-11, 2019; 平成 31 年 1 月 9 日（水）－ 11 日（金）
- Kyoto University, Graduate School of Human and Environmental Studies Building, Room 226;
京都大学人間・環境学研究科棟 226 号室

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Program

1 月 9 日（水） / **January 9**

9:40-10:30 Takuya Mine (Kyoto Institute of Technology)

A self-adjointness criterion for two dimensional point interactions.

10:40-11:30 Shinichi Kotani (Osaka University)

KdV equation and m-functions.

11:30-13:30 Lunch Break

13:30-14:20 Shu Nakamura (The University of Tokyo)

Topics on scattering theory for discrete Schrödinger operators.

14:30-15:20 Michael Loss (Georgia Institute of Technology(Atlanta))

Master equation approach to kinetic theory.

15:40-16:30 Taro Kimura (Keio University)

A super random partition model.

16:40-17:30 Tomohiro Sasamoto (Tokyo Institute of Technology)

Large deviation of spin current for the 1D XX spin chain.

1月10日(木) / January 10

9:40–10:30 Keith Slevin (Osaka University)

Estimation of Lyapunov exponents using massively parallel supercomputing.

10:40–11:30 Tomi Ohtsuki (Sophia University)

Application of convolutional neural network to study random electron systems.

11:30–13:30 Lunch Break

13:30–14:20 Taro Nagao (Nagoya University)

Spectral density of directed scale-free networks.

14:30–15:20 Trinh Khanh Duy (Tohoku University)

Some aspects of beta ensembles at high temperature.

15:40–16:30 Abel Klein (University of California, Irvine)

Manifestations of dynamical localization in the random XXZ quantum spin chain.

16:40–17:30 Fumihiko Nakano (Gakushuin University)

Asymptotic behavior of eigenfunctions for random Schrödinger operators.

18:00–20:00 懇親会 (Party)

1月11日(金) / January 11

9:40–10:30 Makoto Katori (Chuo University)

Determinantal point processes on planes, tori, and spheres.

10:40–11:30 Sergio Andraus (Chuo University)

Dunkl jump processes on averaged paths: relaxation and a phase transition.

11:30–13:30 Lunch Break

13:30–14:20 Takashi Imamura (Chiba University)

q-Whittaker measures and Schur measures.

14:30–15:20 Ryoki Fukushima (Kyoto University)

Geometry of the random walk range conditioned on survival among Bernoulli obstacles.

本研究集会は 科学研究費基盤研究 (C)「ランダムシュレーディンガー作用素の準位統計」(代表者：中野 史彦) 科学研究費基盤研究 (C)「ランダムシュレーディンガー作用素に関する問題の確率論的研究」(代表者：上木直昌) より資金援助を受けています。

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(January 4, 2019)

Abstracts

Master equation approach to kinetic theory by Michael Loss

This talk is an overview on the master equation approach to kinetic theory pioneered by Mark Kac in 1956. This process describes an ensemble of particles undergoing binary collisions. The talk will emphasize the problem of approach to equilibrium in the sense of entropy as well as through estimating the gap. Recent progress concerning three dimensional momentum preserving collisions will be discussed as well.

Manifestations of dynamical localization in the random XXZ quantum spin chain by Abel Klein

We study random XXZ quantum spin chains in the Ising phase. We prove droplet localization, a single cluster localization property that holds in an energy interval near the bottom of the spectrum. We establish dynamical manifestations of localization in the energy window of droplet localization, including non-spreading of information, zero-velocity Lieb-Robinson bounds, and general dynamical clustering. A byproduct of our analysis is that this droplet localization can happen only inside the droplet spectrum. (Joint work with Alex Elgart and Gunter Stolz.) In addition, we will also discuss a new approach to many body localization that works beyond the droplet phase (joint work in progress with Alex Elgart).