

Shoichiro Tsutsui

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Personal Details

Name: TSUTSUI, Shoichiro
Nationality: Japan
Date of Birth: July 5th, 1989
Place of birth: Osaka, Japan
Gender: Male

Present Position

Postdoctoral researcher
KEK Theory Center, High Energy Accelerator Research Organization

Current Research Interests

High energy heavy-ion collisions

I am studying non-equilibrium dynamics of relativistic heavy-ion collisions and phenomenology of quark-gluon plasma. I am also studying non-equilibrium formation of Bose-Einstein condensate and its universality.

QCD at finite density

I am studying the QCD at finite density on the basis of the complex Langevin dynamics.

Education

- 1 Apr. 2014-27 Mar. 2017 Ph.D
Department of Physics, Graduate School of Science, Kyoto University
(Supervisor: Prof. Akira Ohnishi)
- 1 Apr. 2012-24 Mar. 2014 Master of Science (M.Sc.)
Department of Physics, Graduate School of Science, Kyoto University
(Supervisor: Prof. Akira Ohnishi)
- 1 Apr. 2008-23 Mar. 2012 Bachelor of Science (B.S.)
Department of Physics, Faculty of Science, Kyoto University

Awards

Poster Awards, "Thermal Quantum Field Theory 2015", Kyoto, September 2015

Fellowships

- Apr. 2014-Mar. 2017 Research Fellowships of Japan Society
for the Promotion of Science for Young Scientists (DC1)

Publications

Research Papers

- **S. Tsutsui** and T. M. Doi, *Distribution of solutions of fastest apparent convergence condition in optimized perturbation theory and its relation to anti-Stokes line*, Ann. Phys. **XX** (2019) XXXXXX [arXiv:1901.04353]
- T. M. Doi and **S. Tsutsui**, *Modifying partition functions: A way to solve the sign problem*, Phys. Rev. D **96** (2017) 094511 [arXiv:1709.05806]

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- **S. Tsutsui**, J-P. Blaizot and Y. Hatta, *Thermalization of overpopulated systems in the 2PI formalism*, Phys. Rev. D **96** (2017) 036004 [arXiv:1705.02872]
 - **S. Tsutsui**, T. Kunihiro and A. Ohnishi, *Parametric instability of classical Yang-Mills fields in an expanding geometry*, Phys. Rev. D **94** (2016) 016001 [arXiv:1512.00155]
 - **S. Tsutsui** and T. M. Doi, *An improvement in complex Langevin dynamics from a view point of Lefschetz thimbles*, Phys. Rev. D **94** (2016) 074009 [arXiv:1508.04231]
 - **S. Tsutsui**, H. Iida, T. Kunihiro and A. Ohnishi, *Parametric instability of classical Yang-Mills fields in a color magnetic background*, Phys. Rev. D **91** (2015) 076003 [arXiv:1411.3809]

Proceedings

- Y. Ito, H. Matsufuru, J. Nishimura, S. Shimasaki, A. Tsuchiya and **S. Tsutsui**, *Exploring the phase diagram of finite density QCD at low temperature by the complex Langevin method*, PoS LATTICE2018 (2018) 146, [arXiv:1811.12688]
- **S. Tsutsui**, Y. Ito, H. Matsufuru, J. Nishimura, S. Shimasaki and A. Tsuchiya, *Can the complex Langevin method see the deconfinement phase transition in QCD at finite density?*, PoS LATTICE2018 (2018) 144, [arXiv:1811.07647]
- **S. Tsutsui** and T. M. Doi, *On a modification method of Lefschetz thimbles*, EPJ Web Conf., 175 (2018) 11016, [arXiv:1710.06553]
- H. Ueda, T. M. Doi, S. Fujibayashi, **S. Tsutsui**, T. Iritani and H. Suganuma, *Stringy excitation and role of UV gluons in lattice QCD*, PoS LATTICE2012 (2012) 211, [arXiv:1211.3027]
- H. Ueda, T. M. Doi, S. Fujibayashi, **S. Tsutsui**, T. Iritani and H. Suganuma, *Lattice QCD study for stringy excitation and role of UV gluons*, PoS ConfinementX (2012) 046, [arXiv:1301.2864]

Participation in Conferences and Workshops

Invited talks

- *Multi-modification method for Lefschetz thimble integration and complex Langevin*, Keio QFT Workshop 2017 "Toward real-time simulations of quantum field theories and solutions to the sign problem", Keio Univ., 20 September 2017

Oral Presentations

- *Can the complex Langevin method see the deconfinement phase transition in QCD at finite density?*, "Lattice 2018", Michigan State Univ., East Lansing, 23 July 2018
- *Complex Langevin analysis of the finite density QCD*, "New Frontiers in QCD 2018", YITP, Kyoto, 5 June 2018
- *On a modification method of Lefschetz thimbles*, "Lattice 2017", Granada, 22 June 2017
- *An improved complex Langevin dynamics based on Lefschetz thimbles*, "eXtreme QCD", Wuhan, 22 September 2015
- *Parametric instabilities of classical Yang-Mills field*, "Molecule-type workshop", YITP, 18 September 2015
- *Yet another instability in glasma*, "The Fourth Joint Meeting of the Nuclear Physics Divisions of the American Physical Society and The Physical Society of Japan", Hawaii, 10 October 2014
- *Parametric instabilities in the earliest stage of the heavy ion collisions*, "Asian Triangle Heavy-Ion Conference", Osaka, 7 August, 2014
- *Particle production based on 2PI formalism*, "New Frontiers in QCD", Kyoto, 10 December, 2013
- *Plasma instabilities and particle production in Glasma*, "Initial Stages in High-Energy Nuclear Collisions", Galicia, 13 September, 2013

Poster Presentations

- *Formation of a transient Bose-Einstein condensate in the strong coupling regime*, "Quark Matter 2017", Chicago, 6 February 2017

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- *Parametric instabilities of classical Yang-Mills field*, "Quark Matter 2015", Kobe, 29 September 2015
 - *Statistical function instability under strong color magnetic field in 2PI approach*, "Quark Matter 2014", Darmstadt, 20 May 2014

Participation in Domestic Conferences

Invited talks

- *On a dynamical formation of the Bose-Einstein condensate*, "Thermal Quantum Field Theory 2016", RIKEN, 24 August 2016

Oral Presentations

- *Exploring the finite density region of the QCD phase diagram with four flavors of quarks based on the complex Langevin method*, "Meeting of Physical Society of Japan 2018", Tokyo Univ. of Science, 25 March 2018
- *Search for the QCD critical end point by the complex Langevin method*, "Meeting of Physical Society of Japan 2017", Utsunomiya Univ. 12 September 2017
- *Onset of Bose-Einstein condensation far-from-equilibrium*, "Meeting of Physical Society of Japan 2016", Miyazaki Univ. 23 September 2016
- *On a modification of theories with multi-thimble structures*, "Meeting of Physical Society of Japan 2016", Tohoku Gakuin Univ. 22 March 2016
- *Parametric instability of classical Yang-Mills fields*, KEK, Tsukuba, 25 November 2015
- *Parametric instability of classical Yang-Mills fields in inhomogeneous backgrounds*, "Meeting of Physical Society of Japan 2015", Osaka City Univ. 25 September 2015
- *Parametric instability of classical Yang-Mills fields in an expanding geometry*, "Meeting of Physical Society of Japan 2015", Waseda Univ. 24 March 2015
- *Time evolutions of classical fields and particle distribution in glasma*, "Meeting of Physical Society of Japan 2014", Tokai Univ. 27 March 2014
- *Analysis of plasma instabilities and particle production based on Kadanoff-Baym equation*, "Meeting of Physical Society of Japan 2013", Kochi Univ. 23 September 2013

Poster Presentations

- *Exploring the QCD phase diagram with complex Langevin method*, "Thermal Quantum Field Theory", Riken Wako, 29 August 2018

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- *Thermalization of overpopulated systems*, "iTHES/iTHEMS Workshop", Riken Wako, 7 December 2017
 - *Search for the QCD phase diagram with complex Langevin method*, "Thermal Quantum Field Theory 2017", Kyoto YITP, 29 August 2017
 - *An improvement of complex Langevin dynamics based on the method of Lefschetz thimble*, "Thermal Quantum Field Theory 2015", Kyoto YITP, 31 August 2015
 - *Parametric instability of classical Yang-Mills fields in an expanding geometry*, "Physics of Heavy-Ion Collisions", RIKEN Wako, 25 March 2015
 - *Plasma instabilities and particle production in quark-gluon plasma*, "Thermal Quantum Field Theory 2013", Kyoto YITP, 28 August 2013

Seminars and Presentations

- Theory Group Seminar, RIKEN, Wako Japan, 21 November 2017
- Theory Group Seminar, KEK, Tsukuba Japan, 13 October 2016
- Heavy Ion Meeting, l'institut de physique nucléaire d'orsay, Orsay France, 24 February 2016
- Nuclear Theory Seminar, Brookhaven National Laboratory, Upton USA, 29 October 2014