List of publications

Journal Articles

(Peer reviewed, 8 articles)

1. H. Kanno, S. Akiyama, **K. Murakami** and S. Takeda, "Grassmann tensor renormalization group for the massive Schwinger model with a θ term using staggered fermions," JHEP **11**, 036 (2025).

2. T. Aoyama, T. M. Doi, T. Doi, E. Itou, Y. Lyu, **K. Murakami**, and T. Sugiura (HAL QCD collaboration), "Scale setting and hadronic properties in the light quark sector with (2+1)-flavor Wilson fermions at the physical point," Phys. Rev. D **110**, no.9, 094502 (2024).

3. K. Iida, E. Itou, **K. Murakami** and D. Suenaga, "Lattice study on finite density QC_2D towards zero temperature," JHEP **10**, 022 (2024).

4. D. Suenaga, **K. Murakami**, E. Itou and K. Iida, "Mass spectrum of spin-one hadrons in dense two-color QCD: Novel predictions by extended linear sigma model," Phys. Rev. D **109**, no.7, 074031 (2024).

5. **K. Murakami**, E. Itou and K. Iida, "Chemical potential (in)dependence of hadron scatterings in the hadronic phase of QCD-like theories and its applications" JHEP **02**, 152 (2024).

6. **K. Murakami**, Y. Akahoshi, S. Aoki, T. Doi, K. Sasaki (HAL QCD Collaboration) "Lattice quantum chromodynamics (QCD) studies on decuplet baryons as meson-baryon bound states in the HAL QCD method", PTEP **2023**, no.4, 043B05 (2023).

7. D. Suenaga, **K. Murakami**, E. Itou and K. Iida, "Probing the hadron mass spectrum in dense two-color QCD with the linear sigma model", Phys. Rev. D 107, no.5, 054001 (2023).

8. **K. Murakami**, Y. Akahoshi, S. Aoki, "S-wave kaon-nucleon potentials with all-to-all propagators in the HAL QCD method", PTEP 2020 (2020) 9, 093B03.

Preprints

(3 articles)

1. **K. Murakami**, S. Aoki, T. Doi, Y. Lyu and W. Yamada, "S-wave kaon-nucleon interactions from lattice QCD on the physical point," [arXiv:2509.00838 [hep-lat]].

2. Y. Lyu, S. Aoki, T. Doi, T. Hatsuda, **K. Murakami** and T. Sugiura, "Wavefunction-based operator optimization for two-hadron systems in lattice QCD," [arXiv:2507.09933 [hep-lat]].

3. Y. Lyu, S. Aoki, T. Doi, T. Hatsuda, **K. Murakami** and T. Sugiura, "Decoding Two-Particle States in QCD with Spatial Wavefunctions," [arXiv:2507.09930 [hep-lat]].

Proceedings for International Conferences

(Peer reviewed, 6 articles)

1. **K. Murakami** and S. Aoki, "$\Lambda(1405)$ in the flavor SU(3) limit using a separable potential in the HAL QCD method," PoS **LATTICE2024**, 101 (2025).

2. H. Kanno, S. Akiyama, **K. Murakami** and S. Takeda, "Grassmann Tensor Renormalization Group for two-flavor massive Schwinger model with a theta term," PoS **LATTICE2024**, 368 (2025).

3. E. Itou, K. Iida, **K. Murakami** and D. Suenaga, "Phase and equation of state of finite density QC_2D at lower temperature," PoS **LATTICE2024**, 160 (2025).

4. **K. Murakami** and S. Aoki, "Study on Lambda(1405) in the flavor SU(3) limit in the HAL QCD method," PoS **LATTICE2023**, 063 (2024).

5. **K. Murakami**, D. Suenaga, K. Iida and E. Itou, "Measurement of hadron masses in 2-color finite density QCD", PoS **LATTICE2022**, 154 (2023).

6. **K. Murakami**, Y. Akahoshi, S. Aoki, K. Sasaki, "Investigations of decuplet baryons from meson-baryon interactions in the HAL QCD method", PoS **LATTICE2021**, 345 (2022).

External Activities

Presentations at international conferences and workshops

(21 oral and one poster presentations, including 8 invited talks)

1. **Kotaro Murakami**, Sinya Aoki, Takumi Doi, Yan Lyu, Wren Yamada, "S-wave kaon-nucleon interactions and Θ^+ pentaquark from lattice QCD," The 2025 International Conference on the Structure of Baryons (Baryons 2025), nternational Convention Center, Jeju, Korea, November 10-14, 2025.

2. **Kotaro Murakami**, Sinya Aoki, Takumi Doi, Yan Lyu, Wren Yamada, "Lattice QCD study on kaon-nucleon interactions and Θ^+ pentaquark on the physical point," The 42nd International Symposium on Lattice Field Theory (Lattice 2025), Tata Institute of Fundamental Research, Mumbai, India, November 2-8, 2025.

3. **Kotaro Murakami**, Sinya Aoki, Takumi Doi, Yan Lyu, Wren Yamada, "S-wave kaon-nucleon interactions and Θ^+ pentaquark from lattice QCD," The 15th International Conference on Hypernuclear and Strange Particle Physics (HYP2025), The University of Tokyo, Tokyo, Japan, September 29-October 3, 2025.

4. **Kotaro Murakami**, "Lattice QCD studies on Kbar-N interactions and Lambda(1405) in the flavor SU(3) limit," Multi-Particle Reactions 25 Workshop, University of California, Berkeley, USA, July 28-August 1, 2025.

5. **Kotaro Murakami**, "S-wave kaon-nucleon interactions and pentaquark from lattice QCD," Multi-Particle Reactions 25 Workshop, University of California, Berkeley, USA, July 28-August 1, 2025 (poster).

6. **Kotaro Murakami**, "Lattice QCD studies on Kbar-N interactions and Lambda(1405) in the flavor SU(3) limit," Hadron in Nucleus 2025 (HIN25), Yukawa Institute for Theoretical Physics, Kyoto University, Japan, April 2-4, 2025.

7. **Kotaro Murakami**, "S-wave kaon-nucleon interactions and Θ^+ pentaquark from lattice QCD," The 21st International Conference on Hadron Spectroscopy and Structure (HADRON2025), Osaka University, Japan, March 27-31, 2025.

8. **Kotaro Murakami**, "Lambda(1405) in the flavor SU(3) limit from lattice QCD," Hadrons and Hadron Interactions in QCD 2024 (HHIQCD 2024), Yukawa Institute for Theoretical Physics, Kyoto University, Japan, October 28, 2024 **(invited talk)**.

9. **Kotaro Murakami**, "Hadronic properties in two-color QCD at nonzero chemical potential from lattice simulations," Universality of Strongly Correlated Few–body and Many–body Quantum Systems, TOKYO ELECTRON House of Creativity, Tohoku University, Japan, September 3, 2024 **(invited talk)**.

10. **Kotaro Murakami**, Sinya Aoki "Lambda(1405) in the flavor SU(3) limit using a separable potential in the HAL QCD method," The 41st International Symposium on Lattice Field Theory (Lattice 2024), the University of Liverpool, UK, July 28-August 3, 2024.

11. **Kotaro Murakami**, "Lattice QCD studies on Lambda(1405) in the flavor SU(3) limit," International workshop on J-PARC hadron physics 2024 (J-PARC Hadron 2024), J-PARC, Japan, July 23-25, 2024 **(invited talk)**.

12. **Kotaro Murakami**, "Lambda(1405) in the flavor SU(3) limit from lattice QCD," SPICE: Strange hadrons as a Precision tool for strongly InteraCting systEms, ECT*, Italy, May 13-17, 2024 **(invited talk)**.

13. **Kotaro Murakami**, "Lambda(1405) in the flavor SU(3) limit from lattice QCD," Fourth International Workshop on the Extension Project for the J-PARC Hadron Experimental Facility (HEF-ex 2024), J-PARC, Japan, February 19-21, 2024 **(invited talk)**.

14. **Kotaro Murakami**, "Understanding exotic hadrons from the first-principle calculation in lattice QCD," The 2023 Fall Meeting of the Division of Nuclear Physics of the American Physical Society and the Physical Society of Japan (HAWAII2023), Hilton Waikoloa Village, Hawaii, USA, 26 November-1 December 2023 **(invited talk)**.

15. **Kotaro Murakami**, "Lambda(1405) in the flavor SU(3)limit from lattice QCD," Nagoya Workshop on Exotic Hadrons 2023, Nagoya University, Japan, 14-17 November 2023.

16. **Kotaro Murakami**, Sinya Aoki, "Study on Lambda(1405) in the flavor SU(3) limit in the HAL QCD method," The 40th International Symposium on Lattice Field Theory (Lattice 2023), Fermilab, USA, July 31-August 4, 2023.

17. **Kotaro Murakami**, "Hadron scatterings in small chemical potential," 19th International Conference on QCD in Extreme Conditions (XQCD 2023), University of Coimbra, Portugal, 26-28 July 2023.

18. **Kotaro Murakami**, "Studies on baryon resonances from lattice QCD," Third International Workshop on the Extension Project for the J-PARC Hadron Experimental Facility (3rd J-PARC HEF-ex WS), J-PARC, Japan, 14-16 March 2023 **(Invited talk)**.

19. **Kotaro Murakami**, "Studies on baryon resonances from meson-baryon scatterings in lattice QCD", International workshop on "Hadron physics with kaon beam and related topics," online, 3-4 October 2022 **(Invited talk)**.

20. **Kotaro Murakami**, Kei Iida, Etsuko Itou, Daiki Suenaga, "Measurement of hadron masses in 2-color finite density QCD," The 39th International Symposium on Lattice Field Theory (Lattice 2022), Bonn, Germany, 8-13 August 2022.

21. **Kotaro Murakami**, Yutaro Akahoshi, Sinya Aoki, Kenji Sasaki, "Investigations of decuplet baryons from meson-baryon interactions in the HAL QCD method," The 38th International Symposium on Lattice Field Theory (LATTICE 2021), online, 26-30 July 2021.

22. **Kotaro Murakami**, Yutaro Akahoshi, Sinya Aoki, "Studies on meson-baryon interactions in the HAL QCD method with all-to-all propagators," Asia-Pacific Symposium for Lattice Field Theory (APLAT 2020), online, 4-7 August 2020.