

Report of the RCNP Collaboration Research Network (RCNP-COREnet)

COREnet048

PI: TANIDA Kiyoshi

1	Title of research		Revealing the nature of exotic hadrons in Belle (II) by collaboration of experimentalists and theorists
2	List of Participants (Name and affiliation)		Kiyoshi Tanida, Japan Atomic Energy Agency Makoto Takizawa, Showa Pharmaceutical University Masayuki Niiyama, Kyoto Sangyo University
			Mizuki Sumihama, Gifu university and RCNP Osaka University Tatsuro Matsuda, University of Miyazaki Kenkichi Miyabayashi, Nara Women's University
			Yue Ma, RIKEN Atsushi Hosaka, RCNP Osaka University Makoto Oka, Japan Atomic Energy Agency
			Shigehiro Yasui, Hiroshima University Yasuhiro Yamaguchi, Nagoya University Tetsuo Hyodo, Tokyo Metropolitan University
			Katsuyoshi Sone, Tokyo Metropolitan University Osamu Morimatsu, KEK Rento Yamada, The University of Tokyo
3	Period of research		July 2023 – March 2025
4	Main location of collaboration implementation		Online with annual in-person meeting at RCNP, Osaka University
5	Publication list (Please include DOI if available)	Articles	* S. Jia et. al. (Belle Collaboration): Observation of $W(2012)^-$ $\rightarrow$ $X(1530)^0K$ and measurement of the effective couplings of $W(2012)^-$ $\rightarrow$ $X(1530)^0K$ and $X(1530)^0K$, Phys. Lett. B860, 139224 (2025). DOI:10.1016/j.physletb.2024.139224 * S.X. Li et. al. (Belle Collaboration): Search for charmed baryons in the L_c+h system and
			* Guang-Juan Wang, Zhi Yang, Jia-Jun Wu, Makoto Oka, Shi-Lin Zhu: New insight into the exotic states strongly coupled with the DD^* from the $T+cc$, Science Bulletin 69 (2024) 3036–3041. DOI: 10.1016/j.scib.2024.07.012
			* Daiki Suenaga and Makoto Oka: Fate of Σ_c , Ξ_c' and Ω_c baryons at high temperature with chiral-symmetry restoration, Phys. Rev. D 111 (2025) 074032, DOI:10.1103/PhysRevD.111.074032
			* Katsuyoshi Sone and Tetsuo Hyodo: General amplitude of near-threshold hadron scattering for exotic hadrons, arXiv:2405.08436, DO:10.48550/arXiv.2405.08436
			* Ahmad Jafar Arifi, Lucas Happ, Shuhei Ohno, Makoto Oka: Structure of Heavy Mesons in the Light-Front Quark Model, Phys. Rev. D 110 (2024) 014020, DOI:10.1103/PhysRevD.110.014020
		Talks	* Qi Meng, Guang-Juan Wang, Makoto Oka: Mass Spectra of Full-Heavy and Double-Heavy Tetraquark States in the Conventional Quark Model, Phys. Rev. D 111 (2025) 014018, DOI:10.1103/PhysRevD.111.014018
			* Makoto Oka: Quark confinement for exotic hadrons in the quark model, invited talk in XVI-th Quark Confinement and the Hadron Spectrum (Cairns, Aug. 19, 2024) * Makoto Oka: Heavy Hadron Spectroscopy and Quark Confinement in the Quark Model, invited talk in Compact stars in the QCD Phase Diagram (Kyoto, Oct. 10, 2024)
			* Daiki Suenaga: Singly heavy baryons at finite temperature from a chiral model of diquarks, The 21st International Conference on Hadron Spectroscopy and Structure (HADRON2025), (Osaka University, Osaka, 3/27-31, 2025).
			* K. Sone: Threshold cusp structure in multi-channel scattering, The 21st International Conference
			* K. Tanida: Hunting for near threshold (virtual) resonances in Belle and J-PARC, Invited talk in Workshop on strange hadrons as a precision tool for strongly interacting systems (Trento, May 13-17, 2024). * K. Tanida: Belle results on hyperon spectroscopy and future prospects at Belle II, Invited talk in
6	Description of the results and outputs		We had meetings every month, mostly online, with one in-person meeting in November 25-29. We have discussed followings: * General behavior of the coupled-channel scattering amplitude near the two-body threshold, in particular, cases where there are three or more channels.
7	Amount of budget implemented (for internal use only)		472185 YEN