

# — 第969回九大原子核セミナー —

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演題：QCD Casimir effect for exploring chiral partners of hadrons

日時：7月31日(金) 16:30～

場所：(※ オンラインセミナー)

## 概要

The original Casimir effect is a zero-point energy shift induced by two parallel plates, which is a perturbative phenomenon in the QED vacuum (essentially, photon fields). On the other hand, in the QCD vacuum including quarks and gluons (and also hadrons), the Casimir effect should be affected by the nonperturbative properties such as the spontaneous chiral symmetry breaking, color confinement, and instantons. The "Casimir effect" in QCD is still not experimentally observed, but recently similar phenomena were observed from lattice pure Yang-Mills simulations.

In this talk, I will discuss our recent studies about the relation between the Casimir effect in QCD and the chiral partner structures of hadrons such as nucleons [1] and D mesons [2]. In addition, I will discuss the Casimir effect for lattice fermions [3], which will be measured in lattice simulations and strongly correlated electron systems.

[1] T. Ishikawa, K. Nakayama, and K. Suzuki, Phys.Rev.D99, 054010 (2019).

[2] T. Ishikawa, K. Nakayama, D. Suenaga, and K. Suzuki, Phys.Rev.D100, 034016 (2019).

[3] T. Ishikawa, K. Nakayama, and K. Suzuki, arXiv:2005.10758.

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