博士論文公聴会の公示（物理学専攻）

学位申請者 ： 園田　昭彦

論文題目 ： AdS/CFT における電磁場中の不安定性

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場所 ： 理学研究科H棟 7 階セミナー室（H701 号室）

主査 ： 橋本幸士
副査 ： 窪田高弘 、山口哲、飯塚則裕、浅川正之

論文要旨:
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Vacuum instability, leading to pair creation or annihilation of charged particles, is one of the most interesting physical quantities in particle physics. Among various kinds of particle creation process, quark antiquark pair creation is particularly interesting. Quarks and gluons are described by quantum chromodynamics(QCD), which has a strong gauge coupling constant at low energy, popularly known as the asymptotic freedom. In QCD, perturbation is not a good approximation at low energy, thus it is essential to evaluate non-perturbative effects. To calculate QCD vacuum decay rates, we need to calculate non-perturbative effects about the QCD vacuum.

In our paper [arXiv:1403.6336 [hep-th]], by using the AdS/CFT correspondence, we obtained the creation rate of the quark antiquark pair in electromagnetic fields in the N = 4 SU(Nc) supersymmetric Yang-Mills theory with N = 2 hypermulitiplets in the fundamental representation.

In our paper [arXiv:1412.4254 [hep-th]], we worked on the decay rate in the Sakai-Sugimoto model. We evaluated the imaginary part of the D8-brane DBI action in the constant electromagnetic fields. We obtained the creation rate of the massless quark antiquark is non-zero at zero temperature, and also found a critical electric field in the confining phase of the strongly coupled large Nc gauge theory.