

博士論文公聴会の公示（物理学専攻）

学位申請者：山本健吾（Kengo Yamamoto）

論文題目：Construction of higher dimensional field theory with dynamical boundary conditions
（境界条件の動力学を含む余剰次元場の理論の構成）

日時：2016年2月3日（水）13:00 - 14:30

場所：理学研究科 H 棟 7 階セミナー室 A (H701 号室)

主査：細谷 裕

副査：窪田高弘、尾田欣也、湯川 諭、深谷英則

論文要旨：

In field theory defined on multiply connected manifolds, the boundary conditions imposed on fields have the arbitrariness due to the gauge symmetry in Lagrangian density. In the present study of field theory on extra dimensions, these boundary conditions are given by hand. This is called the arbitrariness problem. In this thesis we construct the model including the boundary condition dynamics in order to approach to the arbitrariness problem. We determine the physically realized boundary conditions from the dynamics. As a result we get the nontrivial restriction for the boundary conditions. Especially in the $SU(5)$ case, the symmetry breaking to the standard model gauge symmetry $SU(3) \times SU(2) \times U(1)$ is naturally realized, and the fermion matter content of the standard model can be also realized with a pair of Higgs fields.