

# 茨城大学素粒子論研究室セミナー

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日時：2018/11/12 (月) 13:00-14:00

場所：E-301

Title：Ghost-free vector superfield actions in supersymmetric higher-derivative theories

Abstract：We systematically construct ghost-free higher-derivative actions of Abelian vector supermultiplets in four-dimensional  $N=1$  global supersymmetric theories. We discuss possible building blocks for a ghost-free action and explicitly show that their bosonic parts have no ghost mode and the auxiliary field does not propagate. Higher-derivative terms yield higher powers of the auxiliary field in the actions, and the D-term equations of motion consequently admit multiple solutions in general. We confirm that the well-known supersymmetric Dirac-Born-Infeld action falls into this class. We further give another example in which the standard quadratic kinetic term (Maxwell term) is corrected by a quartic term of the field strength. We also discuss possible couplings to matter fields and a deformed D-term potential. This talk is based on JHEP 1709 (2017) 143 [[arXiv:1708.05129](https://arxiv.org/abs/1708.05129)].