<div align="center">論文題目要旨</div>

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論文題目：Search for the decay of the Higgs boson to charm quarks in p-p collisions at $\sqrt{s}$=13 TeV in the LHC-ATLAS experiment

論文要旨：

This thesis describes the latest search on the Higgs boson decay to a charm and anti-charm quark pair ($H \to c\bar{c}$), where the Higgs boson is produced in association with a vector boson. The associated production of a Higgs boson with a vector boson gives the best sensitivity to probe the Higgs-charm coupling strength, since the leptonic decay of the vector bosons can be used to trigger this process. The $H \to c\bar{c}$ search is based on the full proton-proton collision dataset recorded by the ATLAS experiment from 2015 to 2018. The analysis utilizes a new jet-flavor tagging algorithm and new analysis techniques to increase the signal sensitivity compared to the previous $H \to c\bar{c}$ search by the ATLAS experiment. The new analysis techniques include a multivariate analysis to discriminate signal and background events, and an event weighting method to effectively use all the simulated events, which helps in reducing the statistical error attributed to simulated samples. In the new analysis, an observed (expected) upper limit at 95% confidence level of 12 (11) times the standard model prediction on the $H \to c\bar{c}$ signal strength is obtained. The expected upper limit is a factor of three times improvement compared to the previous ATLAS result.