

Zhi Zheng – Hep Seminar – May 7., 2024  
SLAC

Title: Higgs in a boost: First measurement of VH in full hadronic final state with the ATLAS detector

Abstract: The discovery of the Higgs boson marked a cornerstone in particle physics, completing the Standard Model. Yet, its interactions, especially at high energies, offer a gateway to potential new physics. This talk focuses on the challenges and recent breakthroughs in measuring the Higgs boson decay into a bottom-antibottom quark pair ( $H(bb)$ ), which, despite its prevalence, faces challenges due to the enormous QCD background. We will discuss the recent developments of novel jet substructure and b-tagging techniques that enables the  $Hbb$  measurement. The presentation will cover the first measurement of the Higgs boson production associated with a vector boson in a fully hadronic  $qqbb$  final state using data recored by the ATLAS detector at the LHC in pp collision at 13 TeV and corresponding to an integrated luminosity of  $137 \text{ fb}^{-1}$ . Lastly, I will discuss future projections for these measurements during the High-Luminosity LHC era, leveraging the capabilities of the new all-silicon Inner Tracker (ITk).