

Learning Physics at Future e-e+ Colliders with Machine

Wednesday, 5 August 2020 14:10 (20 minutes)

Information deformation and loss in jet clustering are one of the major limitations for precisely measuring hadronic events at future e-e+ colliders. Because of their dominance in data, the measurements of such events are crucial for advancing the precision frontier of Higgs and electroweak physics in the next decades. In a recent arXiv paper (<https://arxiv.org/pdf/2004.15013.pdf>), the speaker and his collaborators showed that this difficulty can be well-addressed by synergizing the event-level information into the data analysis, with the techniques of deep neural network. In relation to that, they introduced a CMB-like observable scheme, where the event-level kinematics is encoded as the Fox-Wolfram (FW) moments at leading order and multi-spectra at higher orders. Then they developed the classifiers in two ways to achieve this goal: jet-level with the FW moments and brute-force event-level. As an application, these classifiers were applied to measuring Higgs decay width at e-e+ colliders, with the data of 5ab-1@240GeV. The precision obtained is significantly better than the baseline ones presented in documents. In this talk, the speaker will give an overview on these aspects and discuss their potential impacts for future collider-physics study.

Presenter: Prof. LIU, Tao (The Hong Kong University of Science and Technology)

Session Classification: KEK-PH collider