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Precision Frontier of the Higgs Boson with NNLOJET

Saturday, 20 December 2025 11:30 (30 minutes)

In this talk I would like to introduce the state-of-the-art parton level event generator NNLOJET and its application to precision phenomenology of the Higgs boson. The main theory uncertainties of the Higgs boson production at hadron collider are from the parton distribution functions and determination of the strong coupling alpha_s. We have made NNLO QCD accurate PDF grids to help improve both alpha_s and PDF fitting. For di-Higgs production at hadron colliders, we for the first time predicated fully differential cross sections at N3LO QCD accuracy and revealed detailed corrections for the shape of several differential observables. For lepton colliders, we have also studied at N3LO accuracy the Higgs hadronic decay properties. The application of the decay processes to the main ZH production channel will also be discussed.

Primary author: CHEN, Xuan (Shandong University)

Presenter: CHEN, Xuan (Shandong University)

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