時間変更

物理学第二教室　談話会

Machine Learning Parton Distributions and Higgs boson pair production at the LHC

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Abstract：
The lack so far of direct evidence for Beyond the Standard Model (BSM) physics at the LHC provides a strong motivation to develop a extensive program of precision physics, where BSM dynamics could be identified as small deviations with respect to the SM predictions. A central component of such program is the development of robust statistical tools that ensure an unbiased comparison between theoretical predictions and experimental data. One of these tools are Artificial Neural Networks, Machine Learning (ML) algorithms with important applications in classification and forecasting tasks and well as providing model-independent faithful parametrizations of underlying physical laws. In this talk, I will discuss two important applications of ML in the context of LHC phenomenology. The first one is the precision determination of the internal structure of the proton in terms of its constituents, the quarks and the gluons, which is the dominant theoretical uncertainty for many LHC analysis. The second is the use of ML to improve the prospects of searches for Higgs pair production at the LHC, a crucial process that would provide unique insight on the mechanism of electroweak symmetry breaking as well as the first evidence for the self-interactions of the Higgs boson.