

Model independent measurements of standard model cross sections with domain adaptation

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With the ever growing amount of data collected by the ATLAS and CMS experiments at the CERN LHC, fiducial and differential measurements of the Higgs boson production cross section have become important tools to test the Standard Model predictions with an unprecedented level of precision, as well as seeking deviations that can manifest the presence of physics beyond the standard model. These measurements are in general designed for being easily comparable to any present or future theoretical prediction, and to achieve this goal it is important to keep the model dependence to a minimum. Nevertheless, the reduction of the model dependence usually comes at the expense of the measurement precision, preventing to exploit the full potential of the signal extraction procedure. In this talk a novel methodology based on the machine learning concept of domain adaptation is proposed, which allows using a complex deep neural network in the signal extraction procedure while ensuring a minimal dependence of the measurements on the theoretical modelling of the signal.

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