Contribution ID: **48**   Type: **not specified**

Using machine learning to constrain the Higgs total width

Friday 17 January 2020 17:20 (20 minutes)

Despite the discovery of the Higgs boson decay in five separate channels many parameters of the Higgs boson remain largely unconstrained. In this paper, we present a new approach to constraining the Higgs total width by requiring the Higgs to be resolved as a single high pT jet and measuring the visible and partially visible Higgs boson cross section. This approach complements existing approaches from the off-shell technique and lepton colliders. To measure the Higgs boson decays, we rely on new ideas from machine learning for jet classification and a modified jet reconstruction that uses a dedicated missing energy regression. With some assumptions, this approach is found to be capable of yielding similar sensitivity to the off-shell projections with the full High Luminosity-LHC dataset. We outline the theoretical and experimental limitations of this approach and present a path towards making a truly model-independent measurement of the Higgs boson total width.

Primary authors: HARRIS, Philip Coleman (Massachusetts Inst. of Technology (US)); RANKIN, Dylan Sheldon (Massachusetts Inst. of Technology (US)); MANTILLA SUAREZ, Cristina Ana (Johns Hopkins University (US))

Presenters: RANKIN, Dylan Sheldon (Massachusetts Inst. of Technology (US)); MANTILLA SUAREZ, Cristina Ana (Johns Hopkins University (US))

Session Classification: Applications