Generalized Numerical Inversion for Calibration

Saturday, 2 December 2017 12:40 (10 minutes)

In ATLAS we use a sequential jet calibration for jet pT, including a numerical inversion to correct for the detector jet energy scale. Although a sequential jet calibration allows for careful understanding of the various factors that affect the jet energy scale, and allows for significantly reduced MC stats requirement than a global fit, it ignores possible correlations between the features that a multivariate approach might be better suited to handle. However previous efforts to derive a multivariate jet calibration (i.e. with machine learning) have been stymied by the preference that the overall calibration be independent of the underlying truth pT distribution used to train the calibration. Numerical inversion in particular is used exactly because it is independent of the underlying truth pT distribution. "Generalized numerical inversion" is a new idea for a multivariate numerical inversion framework that has potential to account for correlations between features, while still taking advantage of numerical inversion's independence from the underlying training distribution and also without increasing the MC stats requirement. Successful implementation of this technique, which is still in nascent stages, could improve the overall jet resolution in ATLAS and help understand what factors affect the jet resolution.

Session

Lightning Round (5+3 min)

Primary author:CUKIERMAN, Aviv (Stanford)Presenter:CUKIERMAN, Aviv (Stanford)Session Classification:Lightning Talks