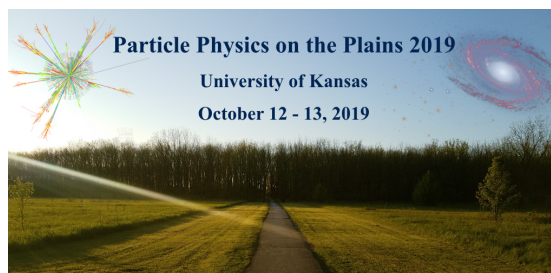Contribution ID: **8**   Type: **not specified**

Next generation kinematic variables for signal discovery and measurement in colliders

Saturday 12 October 2019 11:50 (20 minutes)

High energy physics data, even at the parton level, is high dimensional. Analyzing the distribution of collider events in the full phase-space comes with several challenges–insufficient computational resources to scan the full phase-space, insufficient data to populate it, difficulty in validating monte carlo in the full phase-space, etc.

One way to address the curse of dimensionality is to reduce it. At the parton level, this is typically done by constructing kinematic event variables. But this dimensionality reduction is accompanied by information loss, so it becomes important to construct "good" event variables that capture the main features of the phase-space distribution and minimize information loss.

Construction of good event variables is a challenging task for event topologies with missing particles in the final state. In this talk we'll look at a new class of kinematic event "variables" that can produce mass bumps even for event topologies with missing particles. And in the process, we'll introduce a brand new way of visualizing and representing high dimensional data, which can open up a world of possibilities for new data analysis techniques.

Authors: SHYAMSUNDAR, Prasanth (University of Florida);   MATCHEV, Konstantin (University of Florida (US))

Presenter: SHYAMSUNDAR, Prasanth (University of Florida)

Session Classification: LHC