Contribution ID: **4** Type: **not specified**

Make more from your BSM searches : making unfolded measurements in control regions for generator tuning and re-interpretation

Wednesday, 3 April 2019 09:10 (25 minutes)

Is a new approach is needed to fully exploit the data provided by the LHC?
As the LHC begins long shutdown 2, despite hundreds of dedicated searches, there has been no sign of new physics. In these searches, much effort is put into understanding the control regions, but this information is almost never made public, and is therefore lost to posterity. In this talk, I will argue for a new approach, where, in addition to the traditional limit-setting (assuming no signal was seen!), future LHC search papers could publish simple differential particle-level measurements in the control regions, and possibly even the search regions. This information could be used to improve generator descriptions of the background, thus helping to improve the sensitivity of future searches. Furthermore, the unfolded data can be used as an input to tools like CONTUR to set constraints on BSM models. In the talk, I will present the results of prototype ATLAS paper of this type: a search for 1st/2nd generation lepto-quarks where differential particle-level measurements of SM processes were made in six regions. The talk will illustrate how such measurements could be used for generator tuning and re-interpretation in CONTUR.

Primary author: CORPE, Louie Dartmoor (University of London (GB))

Co-authors: FACINI, Gabriel (University of London (GB)); BUTTERWORTH, Jonathan (University College London (UK))

Presenter: CORPE, Louie Dartmoor (University of London (GB))

Session Classification: Session 2