



Contribution ID: 41

Type: not specified

ReSyst: a novel technique to Reduce the Systematic uncertainty for precision measurements

We are in an era of precision measurements at the Large Hadron Collider. The precision that can be achieved on some of the measurements is limited however due to large systematic uncertainties. This paper introduces a new technique to reduce the systematic uncertainty by quantifying the systematic impact of single events and correlating it with event observables to identify parts of the phase space that are more sensitive to systematic effects. A proof of concept is presented by means of a simplified top quark mass estimator applied on simulated events. Even without a thorough optimization, it is shown that the total systematic uncertainty can be reduced by a factor of at least two.

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Session Classification: Welcome Reception and poster session