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

XQCAT: a model independent analysis of new heavy quarks at the LHC

Monday, 27 July 2015 15:30 (30 minutes)

New heavy quarks are predicted in various scenarios of new physics; depending on their nature they can mix with SM quarks or they can even mediate the production of dark matter states.
Theoretically-motivated scenarios of new physics in general predict the existence of multiple new quarks with different couplings with the SM states or dark matter. Experimental searches of new quarks at the LHC, on the other hand, have so far mostly tested minimal extensions of the SM with new quarks which decay into the third family of SM quarks. No signals have been detected, pushing mass limits above 600-800 GeV, depending on different assumptions about their couplings to SM states. The reinterpretation of mass bounds from experimental searches to test theoretical models is therefore not always straightforward. I will describe model independent methods to recast data from experimental searches. These methods have been implemented in a tool called XQCAT (eXtra Quark Combined Analysis Tool). Considering data from a set of experimental searches at the LHC, XQCAT allows to determine the exclusion confidence level for general scenarios with any number of new heavy quarks which can mix with all SM families. Prospects for the extension of the tool to analyse scenarios where the new heavy quarks couple to dark matter will be discussed as well.

Primary author: PANIZZI, Luca (University of Southampton)

Presenter: PANIZZI, Luca (University of Southampton)

Session Classification: CALC2015 Workshop