

Title:

What has the LHC taught us about the top quark?

Abstract

While the discovery of the Higgs boson in 2012 has completed the Standard Model of particle physics, there are still many open questions about the fundamental particles and forces, from the origin of dark matter through to the searches for new symmetries of nature, to name just a couple. The LHC is hoping to elucidate some of these mysteries. I personally believe that new physics will manifest itself in top quarks. Despite its discovery now over 20 years ago, it is only at the LHC that we can truly enter the era of precision measurements of the top quark.

Measurements of top quark kinematics up to the TeV scale will be presented along with some recent measurements of its properties. Moreover, many signatures for new physics, beyond the standard model, contain top quarks or have signatures similar to those of top quark production. Examples of such searches will be presented, including searches for Vector-Like Quarks, the simplest allowed extension of the quark sector, and  $t\bar{t}$  resonances, looking for new symmetries of nature. Future prospects and schedule of the ATLAS experiment and the LHC will also be briefly discussed.