

MAR13-2012-020733

Abstract for an Invited Paper
for the MAR13 Meeting of
the American Physical Society

Has the Higgs Boson Been Discovered? Latest Results from the ATLAS Experiment at the LHC¹

MICHAEL TUTS, Columbia University

The Large Hadron Collider (LHC) at CERN has had a very successful first data taking run that ended in December 2012. The ATLAS detector has collected about 25 fb^{-1} of integrated luminosity of proton-proton collisions at a center-of-mass energy of 8 TeV. The LHC is the highest energy particle accelerator in the world. The highest profile result has been the announcement of the discovery of a new particle at a mass of about $125 \text{ GeV}/c^2$, consistent with the long sought Higgs Boson. I will start by describing why there is such excitement about this discovery and why it is not just “another” new particle – if it is indeed the Higgs Boson, it is not only the last missing piece of the Standard Model, but represents a fundamentally new type of particle. The discovery comes after almost two decades of construction of the particle accelerator (LHC) and some of the most complex scientific instruments ever built. I will focus on and describe the ATLAS detector and how it works. The ATLAS experiment, together with CMS experiment, announced the discovery of this new particle in July 2012. I will present the latest results on the properties of this new “Higgs-like” particle and the prospects for future discoveries at the LHC.

¹Supported in part by the DOE and the NSF