

Remarks on the present Higgs Boson Status

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On March 14, 2013 the media has reported news concerning the Higgs boson discovery by the LHC at CERN. Declarations like "[The Higgs boson] has almost certainly been found" and "Cern scientists believe newly discovered particle is the real Higgs boson" etc. describe the contents of the present media reports about the search for the Higgs boson. This state of affairs indicates that science has reached a landmark in the very long endeavor aiming at the Higgs boson detection. Therefore, a reminder of several points which cast severe doubts on this interpretation of the discovery is a timely assignment.

1. About two years ago, a team of CERN theorists has published a comprehensive theoretical article that contains predictions of Higgs boson properties (see <http://arxiv.org/pdf/1101.0593v3.pdf>). These authors predict (see pp. 143, 145 therein) that the width of a 125 GeV Higgs boson takes few MeVs. (This point is also mentioned by the March 30, 2013 version of the Higgs boson Wikipedia article http://en.wikipedia.org/wiki/Higgs_boson .) It turns out that the measured width of the LHC 125 GeV particle is about 1000 times larger than that of the theoretical prediction. The huge discrepancy is certainly an obstacle for regarding the newly discovered particle as a rigorous validation of the Standard Model Higgs boson existence.
2. There is another aspect related to the experimental width of the LHC 125 GeV particle. Experimental data show that there are four very heavy particles, the W, Z and the Higgs bosons and the top quark fermion. According to the Standard Model, these particles can be put in three categories: the W, Z which carry the weak interactions; the Higgs boson which "gives mass to all massive particles"; and the top quark, which, like all other quarks, is affected by the strong, the electromagnetic and the weak interactions. Thus, the Standard Model claims that any two particles that belong to different categories have totally different physical attributes. Now the data show that all these particles have a quite similar width. According to the Standard Model the width similarity is just a coincidence while the experimental width of the Higgs boson candidate is a troublesome value. An alternative opinion (see http://ptep-online.com/index_files/2012/PP-31-03.PDF and http://www.ptep-online.com/index_files/2013/PP-33-10.PDF) claims that all these particles are related to the top quark, where the W, Z and the 125 GeV particle are ordinary top quark mesons. As a result, the similar width of these particles stems from the same underlying phenomenon: the weak decay of the top quark (the weak decay intensity increases with the particle's mass and is quite large at these energies). Thus, unlike the Standard Model, the alternative explanation is free of troublesome experimental results. It also claims that the similar width of these particles has a significant physical meaning.
3. On top of that, one should realize that there are very reliable theoretical principles used for constructing quantum mechanics and quantum field theory. An adherence to these principles proves that the Standard Model interpretation of the W, Z and the Higgs bosons contains erroneous mathematical elements (see <http://www.tau.ac.il/~elicomay/MathPhys.pdf> and the two links

mentioned above in item 2). Evidently, an acceptable physical theory cannot be constructed on erroneous mathematical elements.