

The So-Called Higgs Particle

Y. Farzan*¹

The “Standard Model” is a theory describing the properties and interactions of the elementary particles. Theoretical consistency and proper explanations of the masses of the elementary particles imply that there is a spinless electrically neutral heavy state in nature. This particle, which is called the Higgs, is unstable and decays immediately after production. Its decay takes place via a new kind of interaction whose effect appears only in processes involving the Higgs. Before July 4th, 2012, all the particle content of the Standard Model except the Higgs, were discovered. Recently, the international LHC experiment announced the discovery of a new particle with the characteristics expected for the Higgs particle of the Standard Model of elementary particles. This discovery is considered finding the last piece of the Standard Model which took about a century to shape. In this article, we analyze the role and importance of the Higgs particle for physics of the elementary particles in a simple language.

Keywords: Higgs Particle, Symmetry Breaking Mechanism, Weak Interactions, Electroweak, Accelerators, Decay Modes.

*Corresponding Author, Associate Professor, Tel: (+9821)22280692, Email: yasaman@theory.ipm.ac.ir
1. School of Physics, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran.