

Search for the Higgs Boson: a Numerical Adventure of Exclusion and Discovery

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Abstract:

The Standard Model, the theory of particle physics was established 40 years ago and it seems to describe all experimental data very well. All of its elementary particles were identified and studied apart from the Higgs boson until 2012. For decades many experiments were built and operated searching for the Standard Model Higgs boson and finally, the two main experiments of the Large Hadron Collider at CERN, CMS and ATLAS in 2012 observed a new particle with properties close to those predicted for the Higgs boson. In this talk we describe the search process at LEP, the Large Electron Positron collider, and the discovery at LHC, the latest results, with special emphasis on the numerical methods used.